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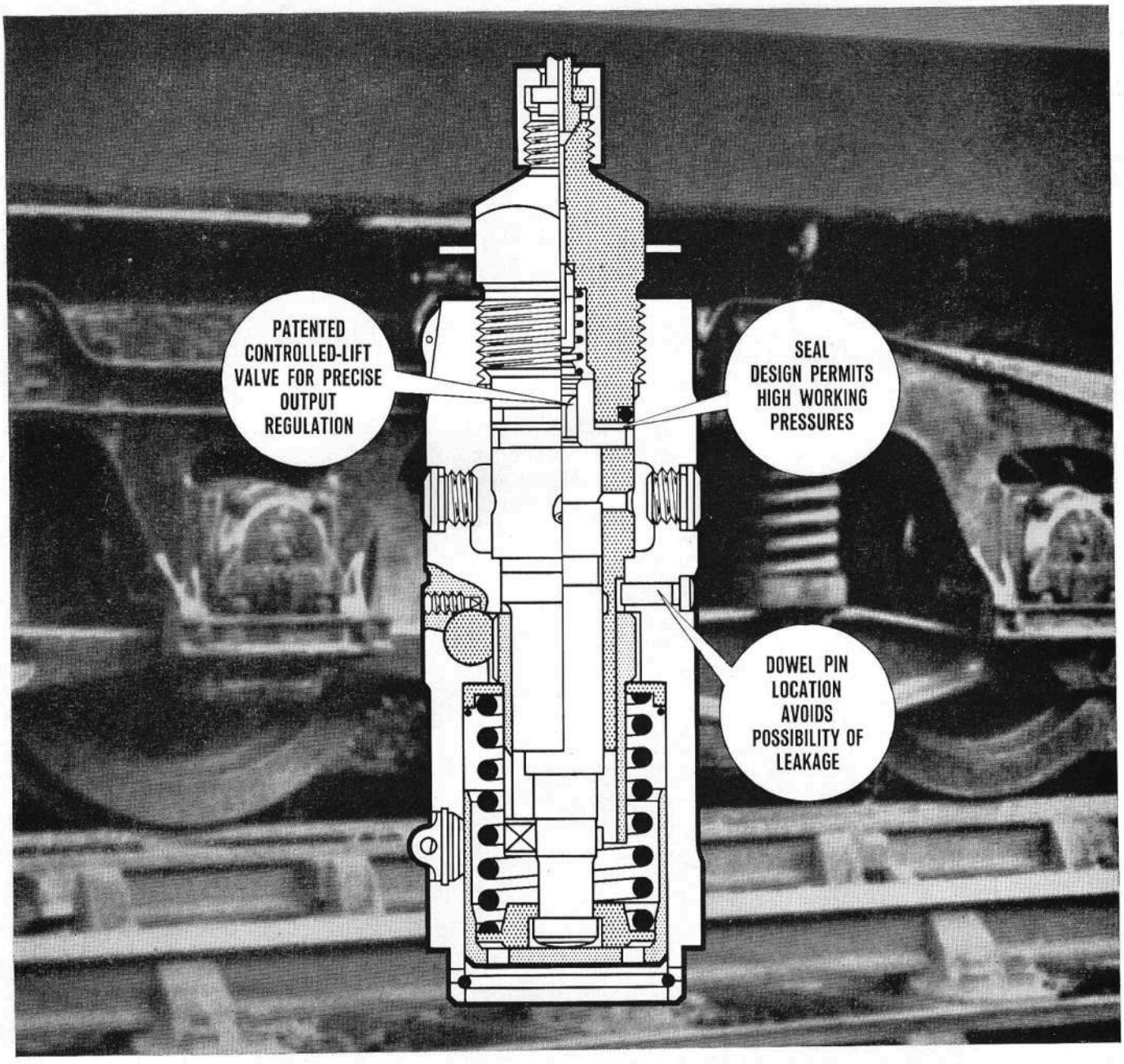
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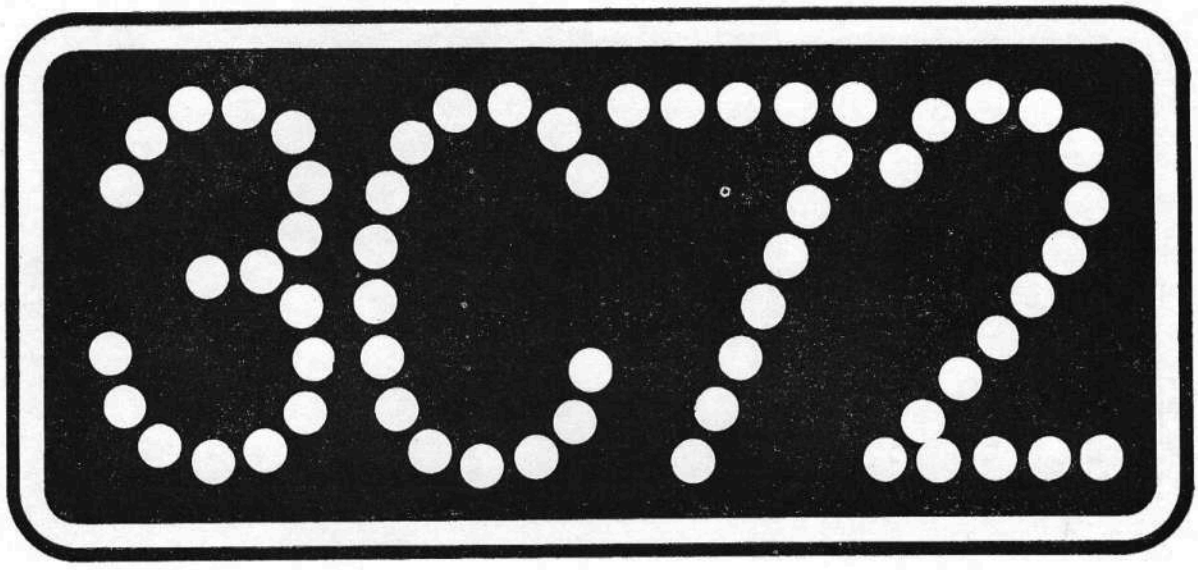

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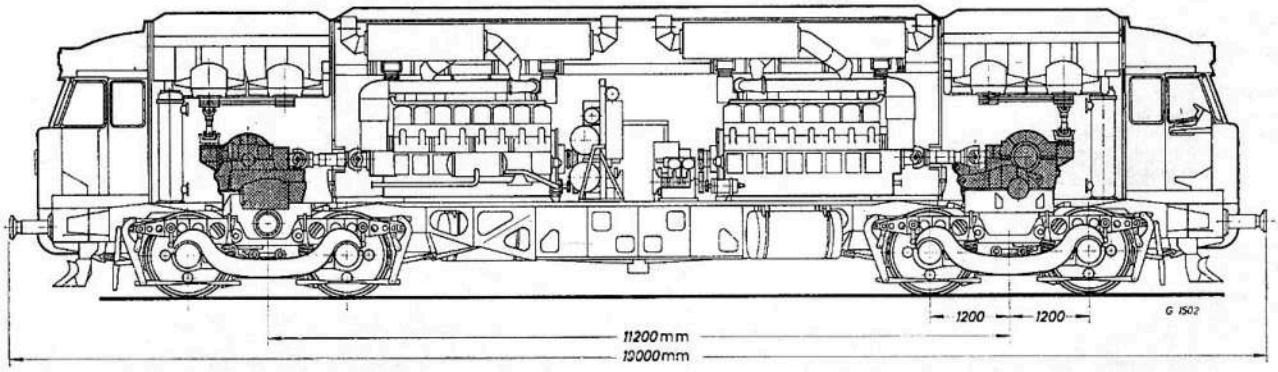

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modern railways

Vol. XXI No. 196 JANUARY 1965

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The Western's £30m saving

STORM cones were hoisted at Paddington early in 1962 with the arrival as WR General Manager of Mr. S. E. Raymond, now the BRB's Vice-Chairman (and its Chairman-to-be according to all the latest callovers in Marylebone Road and Fleet Street). For a time all that came out of the eye of the hurricane were hunted cries. Even now a great deal of the storm damage is unknown to those outside the area, though it is clear that a good many Great Western traditions and practices, time-hallowed to the sanctity of venerated relics, were thrown to the winds. The casualties that were conspicuous—wholesale branch and secondary service closures; revised timetables to improve stock user and load factors; and not least the incidental abandonment of chocolate-and-cream livery—were quite enough, however, to set up a Great Western wailing wall from Paddington to Penzance and Pembroke.

But how many of the mourners realised the state of the WR at that juncture? In a paper to the Institute of Transport in the spring of 1962 Mr. L. W. Ibbotson, then one of the Region's Assistant General Managers and now the BRB's Chief Operating Officer, admitted that the WR was failing to cover its costs by "a large margin". The actual gap, we believe, was close on £30m for both 1961 and 1962. In 1961 the total BR working deficit was £87m, so that the WR alone was probably responsible for over a third of it. One is not, of course, implying that internal factors alone had built up this alarming WR deficit. In his paper, which was summarised on page 320 of our May, 1962 issue, Mr. Ibbotson pointed to a number of external industrial changes, especially in South Wales, that had seriously affected the Region's business. Nevertheless he also made plain that there was room for a great deal of improvement in the utilisation of material and human assets.

Our interview in this issue with the WR's present General Manager, Mr. G. F. Fiennes, who has taken over re-shaping of the Region following Mr. Raymond's translation, needs to be read against this background. If his financial predictions are fulfilled, the elimination of a £30m deficit within four years will be a cogent vindication of much that has wracked the Western these past few years. To have cut manpower requirements by over one-half in a decade is a substantial achievement, particularly as the overall Regional volume of both passenger and freight traffic is increasing; productivity, in fact, has been improved by about 40 per cent during the period. (It is interesting to record—though no invidious comparison should be inferred—that Mr. Fiennes' comparatively short-term aim of a 40,000 staff total equals what is today needed to run the Scottish Region, generally accepted as forming only one-eleventh of the whole BR network.) It is fair to say, too, that the WR's financial return to health has been accompanied by an all-round improvement of the services that matter most to the great majority of passengers and freight users,

A BR/Sulzer Type 4 diesel heads south near Charfield with the 17.00 Birmingham–Bristol express on a June evening in 1964. *Photo by G. F. Heiron*

despite some well-publicised misfortunes—diesel traction troubles that have reduced availability of one class to nearly 50 per cent, and miscalculations in the revised Paddington suburban service, for example.

There is, inevitably, the disagreeable reverse of the higher productivity coin—redundancies. Why should the onslaught on manpower be especially savage? At the worst period of WR deficits, to refer once again to Mr. Ibbotson's paper, salaries and wages accounted for no less than 65 per cent of the Region's entire expenditure. Even now they total about 62 per cent. In other words, since the trend of wages is upward from year to year, and a long way ahead of any price increases the railway can impose if it wants to stay competitive, it would have needed an enormous amount of additional traffic to bridge the income-revenue gap if the labour force, accounting for so much of the Region's expenditure, were to remain untouched. The blindest optimist for the railway's chances could not have hoped for traffic gains on that scale. To some degree the staff reduction will be painless because ordinary wastage is not being countered by fresh recruitment. But in time there will even be pleasure, for higher productivity brings rewards, as some railwaymen are beginning to realise—at mechanised yards, for example, where there is no grade lower than head shunter. For the smaller, picked labour force who remain with the railway there should be bigger individual shares of the wage and salary half of the expenditure cake, as well as jobs of greater responsibility and meaning. The railway ought to become once more a concern that there is both prestige and decent reward in working for.

Strong case for a new image

It is a pity that the public's first hint of British Railways' new corporate identity programme, featured in this issue, should come from a premature leak of the system's revised title, "British Rail". This is the one dubious item of the whole scheme, which was bound to be mocked by ill-wishers who knew little or nothing of the rest. It is extremely debatable, first of all, whether a change of name is crucial to the updating of an image. No airline that one can think of thought it desirable to re-style itself with the change from piston engines to turbo-props or jets. But if there is to be a renaming, surely the new style must be meaningful to the world at large? Merely to drop one syllable from the previous title, largely on the grounds that the result ranges better in publicity displays, and thereby to achieve a name no more relevant to the organisation—in fact, less so—is to invite a prejudiced and unjustified reaction to the whole scheme as a piece of designers' preciosity from a good many of the public. "And now, I suppose, to British Water" is a gibe with too much point for comfort. Initial reservations about the new symbol, on the other hand, are fast changing into approval. A powerful suggestion of nervous energy in the crude vitality of its arrow-heads begins to grow on one—and after all, anything would be an improvement on the previous heraldic abortion. On another aspect, it is a pity that the new coaching stock livery does not seem to provide for distinctive refreshment car styling, the Pullmans apart.

That said about details, the case for a unifying and updating visual scheme of this kind is to us unanswerable. Far too much of the front BR shows to the public—liveries, uniforms, station styles, ill-assorted signposting and publicity material—is still an ill-thought out perpetuation of steam-age railway fashion. The nation in general has shown that it is much more likely to buy use of dieselised and particularly of electrified railways, operating at new standards of speed, than steam. It must be convinced that BR are not merely changing one form of traction for another and running the same kind of service. A brand-new, all-embracing visual identity will do a powerful amount to make the psychological point of a thoroughly transformed transport system.

This, of course, assumes that where the scheme is applied the services it will colour have already been modernised in every department and are functioning beyond reasonable reproach. Here one wonders whether the financial approach has been too defensive. The BRB is stressing that the programme will be put into effect gradually, and understandably is making a virtue of the resultant low annual costs. But if the principle is to be adopted that rolling stock or structures will not generally be treated until they are due for overhaul, there seems to be a serious risk of protracted transitional anachronisms that are bound to provoke snide criticism. One station decked out in the new finery may still be used by an indifferent service overdue for updating, while elsewhere glossy new XP64 blue trains may ply from dreary Victorian piles that have not been touched. Unless one properly modernised route or area is given a comprehensive treatment quite soon the scheme may lose a lot of its impact through painfully slow, piecemeal application.

The few who are already complaining that the scheme is a sinful waste of money by a deficit-ridden concern will be aghast at this suggestion that the expenditure should be bigger and faster. But have they ever seriously examined the indirect effects on revenue and on staff morale and energy of a transformed railway environment? Have they, for example, not only studied the financial results of the Glasgow "Blue Trains", also described in this issue, but talked to the passengers who use them, the staff who run them, *and* looked carefully over the stations and the trains themselves to see how respectfully they have been treated by their users and operators? To cite another case we came across recently, the rebuilding of Chichester station on modern lines, with admirable illuminated signs and excellent passenger accommodation, may have been too expensive for the comfort of the SR's finances. But the stationmaster confirmed our impression that passenger and staff reaction to it was remarkable. Both took immense pride in keeping buffet, waiting rooms, toilets, offices and platforms as tidy as we have ever seen at a BR installation.

A new image unsupported by energy and imagination in operating the railway will, of course, achieve nothing but ridicule. We believe firmly that the one will stimulate the other; and that therefore the BR corporate identity programme is an essential move towards recreation of national pride in the railways, of the kind one senses—and envies—in France and Western Germany.

Has economy gone too far?

In its zealous trimming of redundant assets and reduction of capital locked up in stocks of spares the BRB has courted losses in other directions. The more vivid tales going the rounds of steam locomotives and wagons sold for scrap and then hurriedly hired back to meet desperate shortages are impossible to confirm. But it is unquestionable that some commercial officers in the Regions are concerned at the merchandise traffic put at risk by the sharp run-down of Vanfits and certain types of container. Undeniable, too, is the waste of expensive diesel traction that has resulted from maintenance hold-ups through shortage of components. Earlier this year a good many locomotives on the Western Region at least were incapacitated for no better reason than lack of replacement brake blocks. More recently, as we reported last month, the Western has had its available diesel locomotive stock severely cut down through a dearth of diesel and engine transmission parts. Even without handicaps of this kind, some maintenance officers are restive at the time that main workshops are taking over diesel locomotive overhauls and complain that capacity has been reduced much too quickly. One was heard to say recently that his biggest obstacle to fulfilment of traffic demands was not defects in his diesels while he had them, but retrieving them

from scheduled works overhauls to keep his allocation up to the required numerical strength. The force of this complaint at least seems to have been recognised by the BRB, which recently announced that Darlington works is not to close this year as scheduled. The reprieve, it said, resulted from the concentration of more steam locomotive repair work at Darlington to release capacity for diesel locomotive overhauls elsewhere. The closure of Cowlairs works, Glasgow, has also been deferred. There should be no redundancy among the locomotive repair staff at either works during 1965.

What customs cost BR

At last the first inland facilities have been established for HM Customs clearance of rail freight traffic with the Continent at one inland centre, Birmingham Aston. So at least some of the frustrating congestion of BR ferry ports should soon be relieved. But at Manchester the scheme for a similar facility, first revealed as long ago as November, 1963, makes scant progress, apparently because of the high building costs involved. Absurdly, these have to be borne entirely by BR—who, moreover, have to design a working area to the liking of HM Customs; fully covered accommodation is only the first requirement. Thus the provision of the Customs shed at Parkeston Quay about seven years ago cost the railways around £120,000. BR's estimate for the proposed Manchester Customs centre is understood to reach close on £300,000. Satirists could mine a rich vein in the wearisome procedure HM Customs inflict on incoming ferry wagon traffic at the ports—the solemn addition by BR staff of Crown locks to the seals already affixed to the vehicles at every frontier they have crossed en route, for example, or the insistence that documentation which is good for every other Customs organisation in Western Europe does not meet British requirements. (Incidentally, we believe that BR once secured agreement in principle to Customs examination of Continental passengers' luggage on boat trains instead of at ports; however, arrangements fell through, it is rumoured, because HM Customs then insisted passengers would have to carry their luggage through the train for scrutiny in a specially-prepared brakevan at one end of it.) Not so funny is the fact that the whole quayside routine keeps the ferry wagon throughput of one BR port at least running at about a third of its potential and seriously restricts utilisation of these expensive, specialised vehicles. There are inland Customs centres for international wagonload traffic in almost every major Continental industrial centre. It is ludicrous that their establishment here should depend on such heavy subsidisation from BR's depleted finances.

letters

DOES PAPERWORK RUN A RAILWAY?

SIR,—I read with interest the letter from "Railwayman" (*November issue, page* 300) and was particularly interested in his second paragraph, as I am one of those "keen railwaymen" who has departed to fresh fields.

For four years I worked up from a Junior Clerk to Class 3 in the (then) Operating department as a clerk, and for nearly a year as a Section Controller. For most of that time I was doing Higher Grade Duty on uncovered jobs that resulted from vacancies. During the three years between the ages of 18 and 20, I covered jobs with considerable responsibilities (Controller, Signal Inspector's Clerk, etc.).

Then came the "grand reorganisation" of District and Divisional offices. Nearly everybody was shuffled about; and nearly everybody was given a job about which he knew nothing. Consequently for the six months that I endured it, chaos prevailed on all sides. Now, 12 months later, I hear it is still much the same.

My new job after the reorganisation? A statistics clerk—and for all the gumption and intelligence it required, I think a 10-year-old could have coped quite easily. But no, the post was designated Class 3 at £700 a year. In this office there were also three other Class 3s, two Class 4s and, at the other end of the scale, a Class 1 and a "Special A". This works out about £7,000 p.a. just to sort out and file (for the most part, indefinitely) varying statistics, guards journals, etc. Of course, the majority of the paper that should have come our way never arrived at all.

When one asked the management the purpose and aim of it all, the reply was "Time will tell", or "There is a purpose". Six months did not reveal anything to me, except a lot of accumulating dust. Deeply embittered by the whole business and especially by the complacency of the management, I decided that if I was to keep railways a pleasant thought, then the outside view would suit me better.

I appreciate that statistics are of value, but when you see it in the raw and see so much paper about so little, it makes you wonder. From what I saw I think the costs involved in paperwork generally for just one train must considerably outweigh the actual cost of running and staffing the train.

Watford. "EX-RAILWAYMAN".

(*Full name and address supplied.*)

BR "Siamese twin" shunter

SIR,—With reference to your December paragraph concerning the "Siamese Twin" hump shunting locomotive which is proposed for the Sheffield Tinsley marshalling yard, I should like to point out slight errors in the text concerning the design of these locomotives.

You state that the twin unit will consist of two standard 350–400 h.p. diesel-electric 0-6-0s combined into a single locomotive as a rigid frame 0-6-6-0. This is not true, since the final arrangement will be for two 350 h.p. English Electric locomotives to be *semi-permanently* coupled back to back, one of the locomotive cabs having been removed. The final unit will therefore have the centre cab but will be flexible in the centre in a similar arrangement to that used previously between locomotives and tenders.

A further point to which I would like to draw your attention is that the only arrangements made with Hawker-Siddeley to date have been for the provision of a low-speed indicator for the above locomotives and not the Hawker-Siddeley slow speed control gear to which you refer. The provision of the full control gear is a future possibility, since this would of course continually regulate the speed of the locomotive to achieve a constant humping rate as wagons depart from the hump end of the train, but at the moment this has not been provided for Tinsley.

There is one additional matter which you may consider of interest concerning the Tinsley locomotives, this being that to hump a 1,150-ton train at this new yard requires a tractive effort normally in excess of that possible with two standard 350 h.p. locomotives. To overcome this problem, each locomotive on the twin unit is to be provided with ballast weight so as to uplift the adhesive weight of the pair to a total of 120 tons. This modification will enable the locomotives to deliver at least 75,000 lb tractive effort.

K. MARSHALL,

CM & EE, ER, Doncaster, BR — *Technical Assistant, Marshalling Yards*

[*We regret the error. However, our report that the shunter was to be rigid-framed, with a new central cab, had been specifically confirmed with the BRB before publication.*—ED.]

Does no one matter but businessmen?

SIR,—I recently had the opportunity of visiting the British Railways Exhibition Train at a time when the mayor and other civic dignitaries of my town were also invited.

I was particularly struck by the film we were shown. This depicted nothing more than the expense account train, with its expense account actors performing very realistically. I have learned that other films are shown to other types of audience, but I feel that something could have been disclosed to us as well on BR intentions regarding the commuter from, say, Orpington to Victoria, or Brighton to Haywards Heath.

We were told of the outside sales organisation that they have hired to help sell the railways. If it is anything like the business efficiency companies that have tried to persuade me to let them loose in my own works, it will very quickly absorb any savings the worthy Doctor has achieved.

We were looked after, especially at the reception afterwards, by a most pleasant young lady who travels around with the train. She was extremely interested in checking on the correctness of various railway terms that she had learnt while in conversation with me. In the course of the same conversation, I also learned the extent of her salary, which shook me.

I do feel that if BR are going to sell themselves, or be sold by commerce, accent on the lesser income passenger and a note on improvements for those compelled to buy season tickets would not be amiss. The film we saw, and its commentary, can do nothing but antagonise all but a few fortunate travellers.

Brighton. P.M.C.

(*Full name and address supplied.*)

The Bournemouth electrification

SIR,—Reading your outline of the Southern Region's Bournemouth scheme gave me the now familiar feeling of misgiving and pessimism aroused by most BRB announcements. All the usual miscalculations and ridiculously low estimates of traffic growth and potential are there: poverty of speed—not so much *low* speed en route, but inferior *overall* times due to insertion of needless stops (surely a 90min non-stop hourly service to Bournemouth should be the first prerequisite?); and a relatively infrequent service, which will not attract the extra custom from the commencement of electrification as did the Brighton and South Coast schemes in the 1930s and as a really bold scheme undoubtedly would today.

Remember, this line has some really big places on it. Bournemouth is bigger than many of our cities and the Southampton traffic, especially if its projected satellite city is built, deserves its own service. It is a much bigger kettle of fish than, for instance, the Liverpool Street–Clacton line.

Leytonstone. E. H. MARSH.

SIR,—It is disappointing to read that the Southern Region is going to electrify on the d.c. system to Bournemouth, when there are other lines with high priority for electrification which are not so likely to create difficulties in the future.

The existing 750V d.c. electrified area, extending as far into the Western Division as the direct Portsmouth line, is the most self-contained railway system that could be delineated in the South-East. It has almost all the commuter traffic of the Southern Region and has an unusually low percentage of freight working. In comparative terms the freight per track mile is probably lower than anywhere else in Great Britain on lines which pay their way, and the number of freight trains which can be economically electrically hauled is very low, as so many are inter-Regional. Extension of the electrified area up to the Bournemouth main line will reduce the degree of self-containment, as there are many through trains from Portsmouth, Southampton and Bournemouth to other Regions via Reading or Salisbury. Southampton in particular is a point of origin for freight trains to the north and it is doubtful whether these trains could ever be given the full advantages of electric traction, even if there should be more electrification, as all trains will now have to change systems en route. These cross-country services should increase if Southampton develops as a port and the new town projected in the South-East study materialises between Southampton and Portsmouth. With the introduction of multiple-units on Bournemouth slows, it will not be possible to cover any heavy peaking of cross-country trains on summer Saturdays, which can now be met with spare sets of carriages from peak-hour workings.

From a town and country planning angle, any further electrification in the South of England is wrong as it will tend to increase the drift of population to the South and reduces our resources of good agricultural land. It will also tend to aggravate the economic imbalance between North and South. The North of England, Scotland or Wales would be better places for investment on economic grounds, as they are the depressed areas of Britain.

The investment of large sums in more d.c. electrification *not* dictated by geographical considerations alone is a regrettably short-term policy, when it is becoming clear that the 25kV a.c. overhead is better, and when heavy investment is going into the a.c. systems on one of the least self-contained lines in the whole country. Sooner or later the Channel Tunnel will have to be built and the SNCF will extend 25kV a.c. to Calais. Then a decision as to which is the standard system for British Railways electrification will have to be taken, as the Tonbridge–Redhill–Guildford–Reading–Oxford–Banbury–Birmingham route must then be electrified to handle the increased flow of freight from Europe to the Midlands and North, which must by-pass London.

Sanderstead. GUY S SALT.

Why electrify in Glasgow only?

SIR,—Stage 2 of the Glasgow suburban electrification scheme will undoubtedly benefit the many commuters on the south banks of the Clyde. But what about the other major conurbations of Britain—Manchester, Birmingham and Liverpool, all of which have greater population densities than Glasgow?

After London, Manchester is the centre of the biggest conurbation in the United Kingdom, with almost 2½m people living within 12 miles of its city centre, yet no intensified suburban electric services exist on the pattern of Glasgow's "Blue Trains". Surely, if this Scottish city, which is the centre of only the fourth largest conurbation in Britain, can be so greatly favoured, British Railways should also look at the possibilities in the other major cities.

In terms of population the existing pattern of city boundaries gives no accurate picture of a municipality like Manchester, which is distinctly metropolitan like London, with suburbs stretching for miles outside its jurisdictive limits. What about the Manchester Victoria–Blackpool line? Surely this important link between city and coast deserves a better set-up than the present inadequate diesel service? What a boon it would be for the thousands of daily commuters who live on the Lancashire coast and work in Manchester if they had a fast electric service on the pattern of the Glasgow "Blue Trains". After all the population of the County of Lancashire alone is 5,132,000, which is comparable with that of the whole of Scotland.

True, Manchester has some electric suburban lines, the most profitable being the 33-year-old Oxford Road–Altrincham service, which covers the south-western side of the city, but this should be extended to encircle the southern areas, including Manchester Airport, with rolling stock of the same design as Glasgow's "Blue Trains".

Stretford. CYRIL R. SMITH.

Must electrification pay its way?

SIR,—Your November issue, with its emphasis on electrification, was particularly good. There are, however, one or two points which your contributors raise that I feel these days are being over-emphasised.

Firstly, your article "The Case for More Electrification" states that any project must still show a profit. In these days of planning, environment improvement and the need to provide public transport as a social service, I question this most strongly. It is essential, if we are to remain a civilised nation, that public passenger transport is maintained. Who can say that in the present era of personal transport it will "pay" in the commercial sense? Certain electrifications may well be socially, economically and desirably sound from the national viewpoint, inasmuch as they would ease congestion and road costs, cut down on fumes, noise, etc., and provide a necessary public service.

Secondly, much emphasis is placed on cutting out the frills. My concern is that too many so-called "frills" will be done away with. When an electrification is to be carried out, surely it is better to do the job properly and get the delays occasioned by permanent way/bridge improvements over in the transition period rather than to complete the electrification work and then start on welded tracklaying, bridge renewals, etc. Equally it is essential to my mind that where track re-alignment is needed it should be done with the electrification so that the improvement could be brought in as part of the new service. Nor is it desirable that rolling-stock requirements should be so finely forecast that in the event of one unit proving defective, cancellations result. This is the type of business-efficiency economy which ends in poor publicity and a desertion of the service to other means of transport. Incidentally, it is not efficient either—witness the cutting-down of spare parts that has resulted in a number of expensive diesel locomotives being out of action awaiting parts at a certain British Railways repair shop.

Epsom. R. E. NORTON.

Who wants more speed?

SIR,—Contrary to the views of P. H. English in the November issue I believe that BR need more speed in order to stay in the passenger business, and also that this will matter more than fares.

How many suburban trains averaging less than 30 m.p.h. will be competitive with improved roads in 10 years' time? How many people will stay content with a time of 4hr 40min or longer between Glasgow and Manchester? How many more might not return to rail if this journey came down to 3hr 20min? Surely the fact that BR's fastest trains are the busiest proves that time saved is indeed valued by passengers.

The Scottish Region has revealed that after only seven years the gilt is off the gingerbread of the Glasgow Queen Street–Edinburgh Waverley diesel services. As a result, means of shortening journey times are being considered.

Rutherglen. NORMAN A. S. MOYES.

Clapham Junction to the North-West?

SIR,—If a foreigner were to examine a map of the LMR main line from London to Crewe, I suggest that he would discover that there are two logical terminal points at the London end, Euston and Clapham Junction (via the WL Extension). The latter is logical because it directly serves (by virtue of the exchange facilities with the Southern Region) the whole of London south of the Thames and part of the suburbs to the west far better than Euston can ever hope to do. In recent years many people in this sector have come to regard London Airport as the "Gateway to the North", for the simple fact that London Airport is much more conveniently situated to their homes than Euston. So while the LMR, when electrification is completed, will be able almost to match the airlines in speed of city-centre to city-centre travel on popular routes, such as those from London to Manchester and London to Liverpool, this will not interest the many potential travellers who will still find London Airport more convenient as a terminal than Euston.

From virtually anywhere south or west of London, however, a traveller can reach Clapham Junction as quickly as he can London Airport. Would it not be sensible for some Manchester and Liverpool expresses to start from and terminate at Clapham Junction? A particular difficulty would be, of course, that the catenary is not going to extend from Willesden to Clapham. But surely as an experiment to test the potential it would be worth trying a down morning business-man's express from Clapham Junction to Manchester, with stops only at Olympia (to tap the hotel belt in that neighbourhood), Rugby (guaranteed connections for Birmingham, etc.) and Crewe (guaranteed connections for Liverpool and Chester). There would naturally be a convenient evening return working from the provinces to Clapham Junction.

Leatherhead. N. A. RENDALL.

Double-bolster bogies must be replaced

SIR,—As you observed in November last, it is disappointing that so few BR double-bolster bogies have as yet been converted to the modified single-bolster re-design evolved two or three years ago. One reason may be that this re-design involves the scrapping of virtually all the bolster assembly and secondary springing, with consequent high cost for the replacement parts needed.

It was with interest, therefore, that on a journey to Reading some months ago I rode in composite No. W15837, which had a pair of double-bolster bogies converted to single-bolster in a much simpler manner. The old outer bolster was retained, together with its secondary coil springs, but it was equipped with knife-edge bearings instead of the spherical joints which have been so troublesome, and with a very simple hydraulic damper for lateral movements. The axleboxes were of roller bearing type with improved horn plates.

This re-design is clearly a compromise compared with the first re-design in respect of such matters as swing-link length and overall suspension stiffness. However, from the passenger viewpoint it gave an extremely sweet ride up to 65–70 m.p.h. even when the adjacent bogies were hunting badly. I would welcome more of these "compromise" bogies rather than the present persistence with the thoroughly bad double-bolster unit.

A good example has been set by the Southern Region and the Great Eastern line, who on their m.u. stock have made a clean sweep of virtually all the old Mark I and Mark II bogies by conversions to Mark III or IV. The Mark IV, I would say, is equal to if not superior to the Commonwealth bogie as known on the Southern.

Apart from ride and noise, my complaint about much of the stock built in the 1950s is at the dowdy upholstery and worn-out seat spring interiors. Again, other Regions please copy SR main-line electric stock.

Sevenoaks. P. F. GELIOT.

The Euston outer suburban service

SIR,—The appalling outer suburban service from Euston has been mentioned in your columns before, but the LMR management remains inert. The day I write sees the introduction of a new LT express Green Line service to Hemel Hempstead, Berkhamsted and Tring. In many cases it will be quicker than the train from the northern edge of central London, certainly cheaper, and at least frequent. This bus service will draw off the last off-peak passengers using the few trains which run. Hemel Hempstead now has five Green Line routes; to win back any passengers its new electric service will have to be pretty good—and that means something in the order of every 10min. Bear in mind, too, that Hemel Hempstead station was rebuilt at its out-of-the-way site, and not nearer the New Town. Is it not time that the LMR revealed its outer suburban service plans for 1966?

Northampton may well already have been written off, as a correspondent suggests. Is the LMR management aware that a (nationalised) coach runs on a regular headway from Baker Street to Northampton in 2hr, faster than some trains, at a *period return* fare that is less than BR's second single? One would be interested to know just how LMR propose to win the passengers that the coach company obviously find so profitable.

London, E.10. "E3056".

(*Full name and address supplied.*)

Rationalisation in East Lincolnshire

SIR,—On the subject of freight traffic on the Lincoln–Barnetby line (*May issue, page* 339, *June issue, page* 376 and *July issue page* 27), if the intended concentration on to this line is fully implemented, I foresee some difficulty in operating this double-track route. In the course of a journey on the 10.16 Lincoln St. Marks–Cleethorpes on October 31 last, we passed two Barnetby-bound freights which had been shunted to the up line to allow us to pass. The first, at Langworth, had been stowed away in good time and caused us no delay, but the second, at North Kelsey, caused us to be held at Moortown for 3–4min while it was removed from our path. Its transfer to the up line out of our way also caused delay to an up freight which we passed standing at signals at the next station, Howsham. If this sort of thing becomes frequent, and especially if freight traffic on the line becomes even heavier, BR may either try to withdraw all passenger services (as they appear to be trying to do with the Lincoln–Spalding–March route) so that they do not have to leave long gaps in the freight timetable to allow for the passage of faster passenger trains, or (if the Grimsby–Peterborough line closure is approved and the Barnetby–Lincoln section becomes part of the Grimsby–London route) they may have to consider the provision of loops at intervals along the line, if not the complete quadrupling of the whole distance. There is no sign yet of any of the new connections proposed for the Barnetby area.

Lincoln. L. A. PICKERING.

PRESIDENT,
SWISS FEDERAL RAILWAYS
and
CHAIRMAN,
INTERNATIONAL UNION OF
RAILWAYS (UIC), 1963-4

Dr. Hugo Gschwind

writes to Modern Railways:

The wind of change is blowing over European railways, and over British Railways in particular. These railways have become aware that their future depends on modernisation, on the manner in which they take advantage of the opportunities offered by technical progress. They have come to realise, too, that cybernetics can be applied by them to a higher degree than by any other form of transportation. Having all to meet similar difficulties, mainly growing highway competition, and being able to respect their specific markets, they can make the best possible use of international co-operation. In the International Union of Railways, they have the perfect means of pooling ideas and experience, as well as of sharing the fruit of international research and standardisation.

The modernisation of a railway system can, however, only be carried out successfully if political bodies and potential customers are informed of every step that is taken and can be made to see that good results will be achieved thereby.

MODERN RAILWAYS has always fulfilled a great task in explaining the process of operational and technical modernisation to would-be customers and in informing railway managements of constructive criticism submitted by specialists as well as of the trends of public opinion.

I trust that MODERN RAILWAYS will continue the good work of enlightening all interested parties on the new commercial and operating developments throughout the railways of Western Europe. I also wish to congratulate the Editor on the new, enlarged and modernised form of their paper, from which both the railways and their customers are sure to benefit.

H. GSCHWIND

To avoid over-ordering as first-generation BR diesel deliveries approach completion—

The BRB drafts A NATIONAL TRACTION PLAN

THE draft of a National Traction Plan is in the final stages of preparation at BRB headquarters. It will prescribe the maximum number of diesel and electric locomotives and multiple-units needed to work economically the traffic offering at expected future levels. It will stipulate also the number of maintenance and servicing depots which are foreseen as adequate for long-term operational requirements. With deliveries and published orders for new traction approaching the total necessary to supersede steam power completely, an exact calculation has become essential to avoid over-ordering.

For the first two or three years of BR dieselisation, new locomotives were ordered without clear knowledge of what they could do, or a precise regard for their cost and hence of the most economical methods of employing them. Consequently the relationship between steam and diesel locomotives was not accurately assessed, nor was the extent to which it would be necessary to adjust the timetable in order to use them most economically.

Regions framed their first plans for conversion of successive operating areas from steam to diesels on an approximate assessment of what was needed. These proposals were accepted by headquarters on the assumption that, since total dieselisation and electrification were the agreed long-term aim, there would be ample opportunity to rectify mistakes of quantity or capacity in the first batch of orders by subsequent re-deployment of the units as experience was acquired. Multiple-unit orders also were placed at a time when the ultimate shape and size of the railway were far from established.

Over the last two or three years, traction procurement has undergone some refinement. When the 3,000 mark of main-line diesels delivered or ordered was passed, however, the BRB decided that there must be absolute assurance that the final contracts for first-generation locomotives covered only types and quantities that would precisely satisfy foreseeable traffic requirements. Previous estimates had suggested that considerably more than 3,000 locomotives would be the final requirement. To verify both the total and the types necessary, a thorough survey of the existing fleet and its employment was a pre-requisite and this has been in progress for some months.

The resources of all Regions have been recruited for this study. Although it has been initiated on behalf of the BRB by the Chief Operating Officer, each Region has been asked to re-assess future needs in the light of circumstances prevailing in different parts of the country. The enquiries have examined every facet of operational experience with diesel traction—the reliability of specific types and their maintenance record; their availability; and particularly their utilisation, to see whether the right types have been allocated to the right jobs, whether operation can be reorganised to improve loadings if units are capable of more than they are currently handling, or whether revised diagramming could extract more revenue-earning work per day from some locomotives. Varying Regional practice in employment of the same locomotive type has also come under examination with the intention of imposing optimum standards of operation for each power group.

Regional boundaries are ignored

Consideration of any contribution re-diagramming could make to more economical employment of the existing locomotive fleet—and hence to a reduction of the final orders—is ignoring Regional boundaries. Indeed, the whole subject of locomotive diagramming both on trunk routes and local services is the subject of independent and intensive study, which may ultimately lead to new methods and organisation for this work.

Present performance is not the sole basis of the Plan. It is also weighing what is or can be achieved in present conditions against the more economical operating requirements envisaged in a year or two's time, when more short-distance passenger and freight workings have been eliminated and block trains figure to a greater extent in the freight scene.

In this light the planners may find that the BR fleet is now over-stocked with low-powered diesel locomotives in relation to long-term needs. This is thought unlikely to emerge for some years to come, but if it is proved MODERN RAILWAYS understands the BRB will have to face retirement of some non-standard locomotives built in the early stages of modernisation that are ultimately found to be superfluous.

In this connection, there is so far no hint of any inclination by British industry to promote trade-in schemes of the kind US industry offers to North American railroads, under which life-expired or obsolescent diesels are taken back in part exchange for new models, or for rebuilding and re-equipment to satisfy a fresh operational specification where that is practicable.

Only two more diesel depots?

The final pattern for maintenance depots is now fairly well established and the requirements largely met. Consideration is being given to the extension of Haymarket depot at Edinburgh. Requirements in LMR territory north and west of Crewe will depend to a considerable extent on whether electric or diesel power is finally used for the main line from Crewe to Glasgow, although it seems certain that one maintenance depot for diesels will be required in the Manchester/Liverpool area.

Further servicing depots are certainly envisaged, but in deciding sites for these the planners will again disregard Regional boundaries and consider the economies that might be achieved in this context also by re-diagramming of locomotive work. They are also keeping in the forefront of discussion the long-term pattern of operation, so that there will be no risk of handicapping this by a short-sighted choice of depot location.

The final orders to meet BR's first generation diesel requirements are expected shortly, following completion of the National Traction Plan, and it is hoped that deliveries will be completed in time to eliminate steam by early 1968. At present, however, the aim of ridding the Eastern and Western Regions of steam by the end of this year may not be fulfilled because of lagging deliveries. On the other hand, if traffic levels should fall, the rate of steam withdrawals could be accelerated without need of diesel replacements and steam traction might be ended ahead of schedule.

The over-riding objective at present is the replacement of steam by standard types of diesel and electric locomotives. What the future will hold, says the BRB—presumably with British industry in mind—is not clear, but it concedes that there can be no brake on progress. Although at the moment no new types of locomotives are being developed, it says that they are bound to come once the immediate task has been successfully completed. In particular, the need for further acceleration of passenger trains and for heavier freight trains is gaining acceptance. However, there seems little inclination to begin early evaluation of prototypes in anticipation of probable reqirements, so as to work up proven designs that can be confidently put into series production when they are needed.

The Western will

Left: Mr. G. F. Fiennes, General Manager of the WR and Chairman of the Western Railway Board.

Below: The westbound "Bristol Pullman" at St. Annes Park, Bristol. *Photo by G. F. Heiron*

G. F. Fiennes, Chairman and General Manager of the Western Region, tells G. Freeman Allen how the WR will rid itself of operating losses by the end of 1965. By 1967, the Region may have only 40,000 staff, compared with 114,000 in 1954.

be in the black this year

ALLEN: Mr. Fiennes, you have publicly prophesied that the Western Region will be in the black by 1966. The principal measures to achieve this improved financial state that you have quoted are: more efficient handling of diesel traction, better use of manpower, withdrawal of uneconomic services, mechanised track maintenance—and finally streamlined management. Can we look at these in sequence? First of all, just how are you going to cut the costs of diesel operation and maintenance? Can you give me any clear-cut figures of savings already achieved in train running, crew, fuel and maintenance costs by dieselisation of a specific area—say South Wales, for example?

Fiennes: Yes, it's quite correct that by Christmas, 1965, we expect to be in balance—that is to say, our revenue will equal our working expenses, which will include depreciation and amortisation. Of course, the diesels are contributing enormously to it. In South Wales, which you mention, we reckon that the introduction of diesel multiple-units on local services and also on the through services to Birmingham has already saved us £2½m a year; the diesel locomotives, which we're introducing by stages, will be saving another £6m a year when the programme is completed early in 1965. Now a great deal of that, of course, comes from better utilisation of the locomotives—larger loads, running one train where we ran two before, particularly on the freight side. But there are also very large benefits in maintenance. Our broad calculation is that, whereas steam maintenance was costing us 4s 2d a mile, diesel maintenance is costing us 2s 9d.

The WR needs a 4,000 h.p. diesel

Allen: Are you satisfied that your diesel traction availability and utilisation are somewhere near the best you can make them, or is there further to go? In other words, are these traction savings that you've mentioned capable of still more improvement?

Fiennes: Yes, we must certainly do better both in availability and in utilisation. Our 1,750 h.p. diesel-electrics, for example, are performing extremely well and we are getting availability better than 90 per cent. But with the diesel-hydraulics, which have run into some mechanical troubles, largely with components of German design such as the transmissions and axle drives, we're not getting availability as good as 80 per cent at the moment. When all the modifications are done, we have a pretty fair assurance of improvement, but the modifications are taking a long time—and, of course, they're extremely expensive.

Allen: How long do you think that this generation of diesels will satisfy your commercial requirements, both for passenger and for freight traffic?

Fiennes: On the passenger side, our highest-powered diesels—the D1000 Class and the D1500—are capable, with the loads which we want to work to South Wales and Bristol, of average speeds of 64 and 65 m.p.h. end-to-end between London and Bristol, London and Cardiff and London and Plymouth. In terms of the present competition—without motorways—they're doing very well and we are getting long-distance passenger traffic back in quite a big way.

Allen: Can you quote me an example?

Fiennes: Well, if we take the Plymouth route, the average daily increase for the group of three trains including the "Golden Hind"—that is the train on either side of it, as well as the "Golden Hind" itself—has been 90 passengers in each direction. Since we put on the "South Wales Pullman", the average increase for a similar group of trains on the Cardiff route has been about 120 people in each direction. That is a very good start indeed. But we must go faster when the Severn Bridge is built and the M4 to South Wales is in operation. Then, I think, we shall have to get from London to Cardiff in 2hr, London to Plymouth in 3hr 30min and London to Bristol in about 1hr 40min. Certainly 2,700 h.p. is not quite good enough for that. Even with ironing out of curves, which we are going to do, we shall want something better. There is in the market, of course, the 3,300 h.p. "Deltic", but I believe even that to be not quite powerful enough. So we are looking around.

Allen: What is the financial balance of advantage between improvement of the permanent way to save minutes by the removal of restrictions, and expenditure on new and higher-powered locomotives for the same purpose? How far in fact can you get with improvement of the track and how much does it cost?

Fiennes: On the Plymouth line, if we tackle the permanent way comparatively inexpensively—I am talking of expenditure of the order of £80,000 to £100,000 for the 224 miles—we should expect to get about 8min betterment. We want about 25min betterment and the remainder of that would have to come from more powerful locomotives.

Allen: Is it worth spending even £100,000 just for 8min benefit in your view?

Fiennes: It is a 25min gain all told that we're after, and in my opinion this is very much worth having. I believe that speed is a major factor in competition with road and, over the longer distances, with air. Standards of comfort should be the same when we have long-welded rail and properly canted curves. But in addition, when you take 25min out of a run you do get into the realm where you can save train-sets, locomotives and crews, as we proved in 1951 and 1955 with the Great Eastern express services.

From 10,000 p.w. staff to 4,500

Allen: Now that you have brought us back to the savings theme, let's go on to the next of the major fields in which you plan economies. So far you have accounted for an annual improvement of about £8½m. How much will your predicted manpower savings add to this?

Fiennes: The scope is very wide indeed. Payment by results on the permanent way, of course, is already in operation and has cut the permanent way staff by something over 3,000 from a total of 10,000. We are now coming into the age of mechanical track maintenance with the Plassermatic tampers, to add to the maintenance benefits we shall get from

continuously welded rail on our main lines. The total effect, considered over 14 years from 1956 to 1970, will be a reduction in permanent way maintenance staff from 10,400 in 1956 to a little over 2,000 by 1969. At the moment we have about 4,500 on the permanent way staff, so that there is an economy of more than 50 per cent still to come. If you allow roughly £1,000 as the annual cost per man, taking into account holidays, relief, National Health and the rest, the financial improvement on the permanent way side will be more than £2m.

Next, our multiple-aspect signalling programme is going forward. By 1969 we hope to have continuous multiple-aspect signalling on all our main routes: to Bristol, South Wales, Gloucester, Oxford and a good way towards Exeter. By withdrawal of unremunerative services, elimination of steam, closure of the last steam depots and better utilisation, particularly on the freight side, of the diesels we have, and by more efficient operation of our terminals, concentration of stations and work study in carriage sidings, passenger stations and goods terminals, we are already using our manpower much more productively.

So, from about 55,000 on our staff at the moment, we expect to get down by these and other means to 45,000 odd. Then one acknowledges that the administrative machine, which 10 years ago was looking after 114,000 people, will in the future have to cater for only 45,000; it will be running only 250 stations compared with 1,100, about one-seventh the number of motive power depots and about one-half the number of marshalling yards. There should be a reduction of the administrative staff to correspond. That brings us down near the 40,000 mark and we expect to reach it with the introduction of more single-manning of locomotives, Liner trains and merry-go-round coal trains. The Region's fairly short-range objective for, say, 1966–7, therefore, is a staff of 40,000.

Re-shaping loses little through traffic

Allen: How much further have you got to go before your physical re-shaping is complete?

Fiennes: In terms of stations, we should pretty well complete it in 1965. As for the trunk network, we are keeping more than four-fifths of that and there isn't very much left to do there now that we have rationalised two routes between London and Exeter by making the Paddington route the principal one for through traffic to Exeter and beyond and arranging the Waterloo route to serve Dorset and Wiltshire. There remains some rationalisation to be done on the routes between Bristol and South Wales on the one hand, and Birmingham and the North-East on the other—and also, of course, between London and Birmingham. There is a good deal of tidying up to do at Gloucester, Bristol, Cardiff and in London, but the plan is already far advanced. Within 12 months we should pretty well have completed it, I think.

Allen: Where you have already cut out minor services, to what extent are you retaining the passengers and freight now cut off from immediate access to rail?

Fiennes: We've lost very little indeed on the freight side. Some local passenger traffic has left us, naturally, because people are now travelling to more distant main-line railheads by car.

Allen: Would you venture an estimate of the proportion of passenger traffic that you've retained—that is, people who are still using the railway even though they now have to make a fairly long car or bus journey to the nearest railhead?

Fiennes: If we're talking of people making a journey of more than 50 miles, I should say we are retaining 90 per cent of them. You have to remember that our main-line services are much more attractive in terms of speed and in terms of frequency than they were 10 years ago. It's much less trouble on a journey of more than 50 miles to drive 10 miles to the station, put your car in one of the parks which we are more and more providing, and get on a train, rather than to drive the whole way. Both in terms of numbers and in terms of money, passengers on our main-line services have shown a very welcome—and a very large—increase this year.

Allen: Do you think it's as important to try and achieve co-ordination of *public* road transport services as to provide adequate parking space for private motorists? Some of us think that progress to effective co-ordination is halting, to say the least. Can anything be done to expedite efficient public transport co-ordination at railheads?

Fiennes: This is entirely a personal opinion, but I am quite convinced that for the future the private car is our best feeder. That does not mean that the bus isn't useful also. Partly by Ministerial direction and partly as the outcome of TUCC business, but much more through our representation on the boards of the bus companies and from the standing joint committees which we have to deal with timetables, we *are* getting closer co-ordination with the buses. And they are being extremely helpful in getting traffic to us.

Allen: How do you square your view that the private car is the feeder of the future with the fact that you serve a holiday area to a considerable extent and that, even though you may be trying to damp down the summer peak, a lot of people will still travel by train from the Midlands and the North-West to Devon and Cornwall? Are you satisfied that you are making adequate provision for them to get from the railhead at which you will now drop them to their seaside resort?

Fiennes: Coastal traffic is a separate problem. It won't have escaped you that the last Minister of Transport, when he was considering the seaside resorts, refused permission in at least one case and deferred permission for a closure until the roads were improved in at least one other. This may be significant. Personally, I don't believe that people will cheerfully be dumped off a main-line train at a railhead and go 20 or 30 miles by bus to their seaside resort. Whether we keep the branches to seaside resorts open, or whether we say that this is traffic for which we do not choose to cater, is partly a business and partly a social judgment. The arithmetic is being done, particularly for the Cornish and Devon branches, and we and the Minister will make up our minds in due course. I think we have a clear-cut choice: either we continue to cater for this traffic or we choose to let it go throughout by coach or car.

Allen: When we were talking about acceleration of express services, you confined yourself to routes radiating from London. I presume you're satisfied that the general pattern of these services, with their comparatively high frequency, is on the right basis for the future; but what about cross-country routes? Are there any on which you think improvement and speed-up is necessary—assuming, of course, that you think they have a good potential traffic which you can tap?

Fiennes: With something over 15m people in the London hinterland, this is obviously the prime objective for any railway. However, with more than 3m people in South Wales and over 10m people in the Midlands, these, although secondary, are still highly important objectives. We have improved our service from the West Country and Wales to Manchester and Liverpool in this last timetable. The Newcastle to South Wales and Bristol service has recently been put on a new footing. I think both deserve still further improvements.

Must cross-country travel be slower?

Allen: I assume that there's no hope, of course, that cross-country services can ever be as fast or as attractive as those radiating from London.

Fiennes: Well, you choose, don't you? You start off from a very large centre of population with a good load and you have some very large objectives on the way—Birmingham, Liverpool, Manchester, Sheffield, Leeds and Newcastle. But you've also got some secondary objectives—Gloucester, Worcester, Burton-on-Trent, Chesterfield, York and many smaller places. Now, do you—and I put this as a question rather than as a final answer, because I am not quite sure what the final answer is—do you decelerate your service between the principal objectives in order to cater for these intermediate towns; or do you run a secondary service for Gloucester, Worcester and so on? My philosophy has always been to go for the main objectives and provide another service for the secondary towns. We did that in East Anglia by making the London–Ipswich–Norwich service every other hour and then running trains to serve Chelmsford, Witham, Colchester and smaller objectives in the alternate hours. I think that sort of a pattern may very well emerge on the South-West-to-North-East axis. But it is really a matter for market research—and on this route we're not yet very well advanced with that.

SOUTH WALES DIESELISATION WILL SAVE £8½m.

Above left: The 3.34 Normanby Park–Cardiff steel train from the Scunthorpe area passes Churchdown, between Cheltenham and Gloucester, behind "Western" class diesel No. D1066 *Western Prefect* on May 2, 1964.

Above right: A Cardiff General–Merthyr diesel multiple-unit leaves Quakers Yard LL on July 31, 1962.

Below: A mineral train for Ebbw Vale at Aberbeeg on August 26, 1964 with English Electric Type 3s Nos. D6903 and D6834 at front and rear respectively.

Photos by B. J. Ashworth, P. J. Lynch (above right)

"We are getting closer co-ordination with the buses; and they are being extremely helpful in getting traffic to us." Buses wait for traffic outside Newport High Street. *Photo by G. F. Heiron*

Allen: But you've just set up a new office to cover this field, haven't you?

Fiennes: Yes, the whole of our passenger promotion has just been reorganised and we have appointed Mr. G. A. V. Phillips, who was our London Divisional Manager, to be the Region's Passenger Development Manager with the idea of doing much more market research as well as working up many more ideas for passenger promotion and putting them urgently into operation. There's a great field here, I'm sure, which we haven't really exploited yet—and we must do it. It isn't enough to say that the timetables and some posters will sell our service. We have got to get much more personal contact. You may remember that when we put the "Master Cutler" on between Sheffield and King's Cross it was an immediate success. But although we advertised, although we postered, although we issued handbills, when we did our market research after the Pullman had been running for three months, more than 75 per cent of the people on the train said that they hadn't joined it for any of those reasons, but because a friend told them about it. Therefore we want many friends. We want stationmasters, sales representatives and all railwaymen to tell individuals that we run a good service and that they would be much more sensible to use it than go ploughing up the A40 or A4 on their way to work.

"Irish traffic? We shall bid for the lot"

Allen: How confident are you that you can retain most categories of passenger traffic?

Fiennes: I think that business travel will not only stay with us, but that as the disadvantages of road become more evident it will more and more come to us. By and large, these are people who travel by themselves and therefore the economics of car travel are against them. The comfort—or rather discomfort—of car travel is against them; and the distractions of car travel are against them. When you come to family travel, four people and all the bits and pieces you can carry in your car are something that the railways find very difficult to compete with economically and from the viewpoint of convenience. I think we can and shall do more in cost—family tickets, perhaps—and in terms of convenience, through much more widespread provision of seat reservation arrangements at intermediate stations, cheap meals on trains and so on. This should recapture some of the family travel. But we shall not attempt to bid for more than a fringe of this traffic at its peak. On the other hand, to take the specific instance of the Fishguard–Rosslare route to Southern Ireland, I think we shall bid for the lot—first, by taking people by train down to Fishguard and across to Rosslare with the opportunity of hiring a car in Ireland; and, second, by the introduction of car-carrying trains, which will carry family and car together.

Allen: Will these be in the same category as the car-sleepers on the Anglo-Scottish routes? You say you will be bidding for the lot, but a good many Irish holidaymakers won't want to pay as much as sleeper berths will cost them.

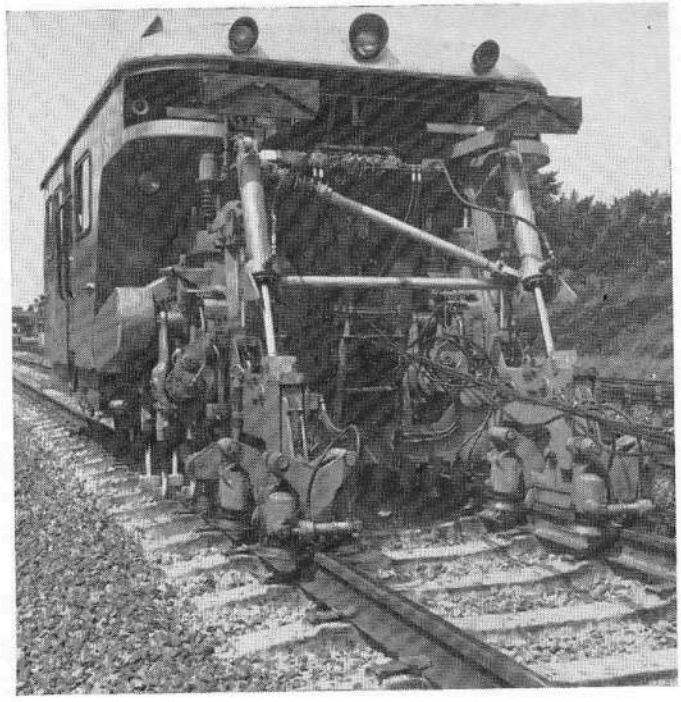
Fiennes: That's jumping the gun a bit. We are doing the economics of it at the moment, but I think it is quite certain that we shouldn't get a sufficient proportion of the traffic if we make it glossy. Our present idea is to use car-flats, some of which are spare at weekends in the summer, for a train that will make at least one round trip a day between London and Fishguard and in which the passenger accommodation will be second-class vehicles with rug-and-pillow sleeping for night journeys, with each passenger guaranteed a separate side of a compartment.

Allen: To revert to business people for a moment, is there a good market for Pullmans?

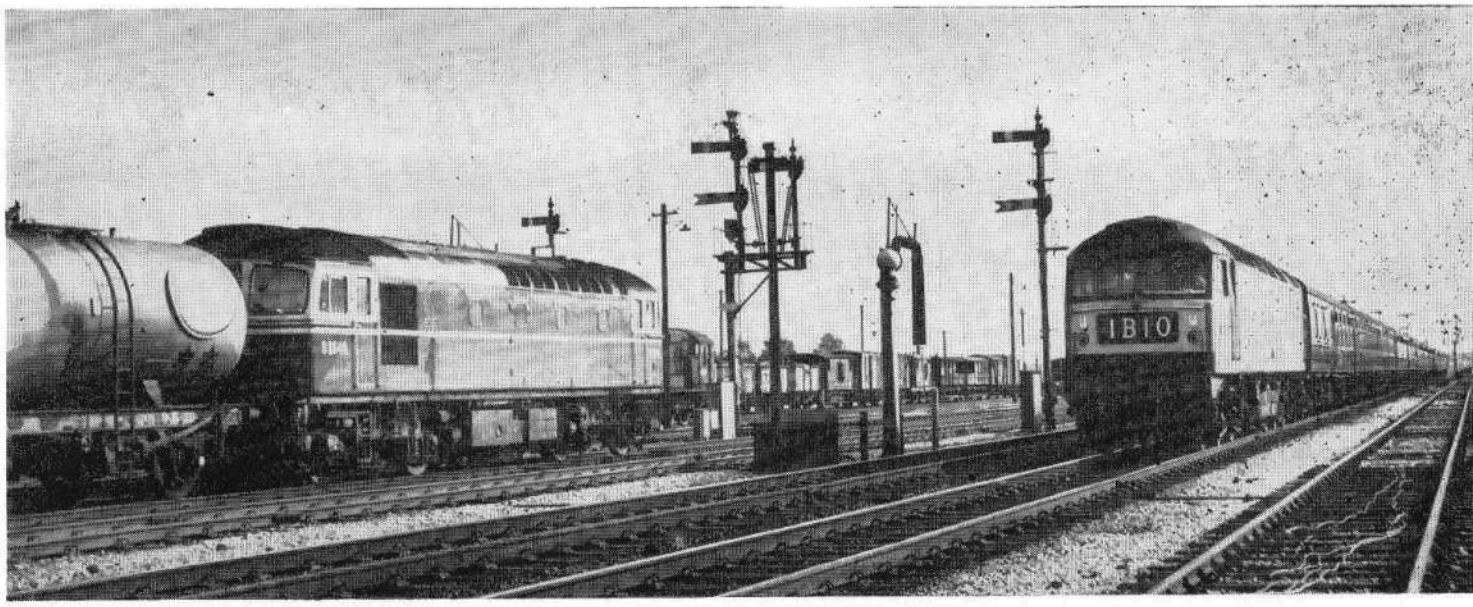
Fiennes: It seems so. In the principal business paths of the day we run most successful Pullmans between South Wales and London, and between Birmingham and London, and a not-quite-so-successful but still very rewarding Pullman between Bristol and London. Indeed, the mid-day "South Wales Pullman" working as far as Cardiff, which we have only introduced this winter, is loading to over 60 per cent of capacity in one direction and to over 50 per cent in the other.

Allen: Have you any thought of extending outer suburban stops in the London area by expresses in the peak periods of the day?

Fiennes: Yes. We are already stopping a great number of trains at Reading and this railhead is being very well used in both directions. We started recently to use Woking as a London Airport railhead from Devon and Cornwall, reasonably successfully, and we may use similarly one station on the Reading–London run—probably Hayes, but it may be Slough—particularly for the business people who fly to Europe, leaving London Airport early in the morning and coming back in the



"We are now coming into the age of mechanical track maintenance with the Plassermatic tampers, to add to the maintenance benefits from continuously welded rail." One of the Region's new Plassermatic tampers is seen here. *Photo by British Railways*



"Our highest-powered diesels are capable of average speeds of 64–65 m.p.h. end-to-end between London and Bristol." Brush 2,750 h.p. Type 4 No. D1584 on the 10.45 Paddington–Bristol passes SR Birmingham RCW Type 3 No. D6540 on a block oil train at Scours Lane Sidings, Reading on October 10, 1964. *Photo by Gerald T. Robinson*

evening. It is in our minds to stop there one train each way on each route in the morning and one on each route in the evening.

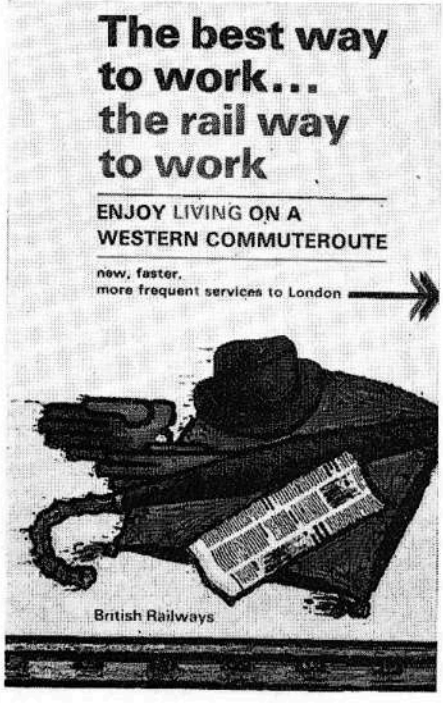
"We like commuters"

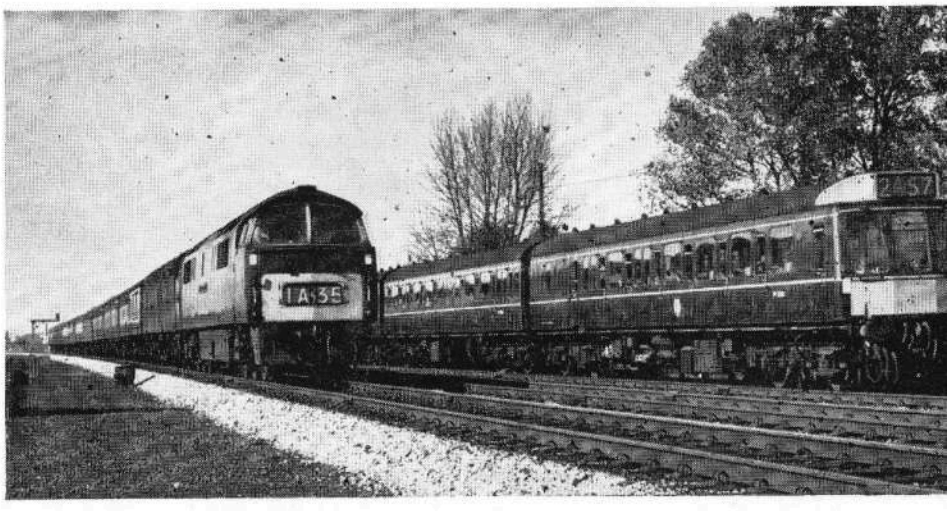
Allen: If we may turn now to commuter traffic, I was fascinated to see recently that on one day you issued some very attractive-looking publicity to woo more commuters to your outer London suburban trains, then the next day British Railways announced the withdrawal of cheap-day returns with the aim of controlling the peak load. Now how does this tie up?

Fiennes: I don't think they said they wanted to "control" the peak—I wouldn't phrase it like that at all. The point is that administratively it is much better for us to induce people to take season tickets instead of five day returns. That is really the object. As for the Western, we like commuters. We think that we can produce and operate a good, profitable commuter service. For that, however, we want not only more trains, which we put on in September this year—55 of them per week; we also want more people to fill them. Even if we get another 2,000 daily commuters into Paddington, our load factor still won't be so high that we have any great number of people standing. This campaign is directed specifically towards people travelling 30 miles or more. Our real sights are on the territory between Oxford and Reading and between Newbury and Maidenhead. If we can attract several hundred more people from that area, this will be, with a small increase of fares, a slightly profitable, comfortable and efficient service.

Increase "almost an embarrassment"

Allen: A great deal of emphasis is laid in BR statements and publicity these days on money that has been saved. We've


The best way to work... the rail way to work
ENJOY LIVING ON A WESTERN COMMUTEROUTE
new, faster, more frequent services to London
British Railways



"We like commuters. We think that we can produce and operate a good, profitable commuter service."

Left: The cover of one of the WR's latest London commuter service brochures.

Right: A Paddington-bound suburban diesel multiple-unit is overtaken by "Western" class diesel No. D1044 *Western Duchess* with the 8.53 Taunton–Paddington on October 19, 1963. *Photo by Brian Stephenson*

talked a great deal about that so far. To what extent are you making new money, especially on freight services? And to what degree has the modernisation of freight services and salesmanship been effective in winning new traffic?

Fiennes: We have lately put on three new block trains for iron and steel from South Wales. They start from Llanelly and call at the principal steelmakers on the way to Birmingham, Sheffield and South Lambeth. We started very modestly with about 150 tons of traffic a day on each of these trains. The amount of traffic which is on them is now almost an embarrassment and we're having to consider duplicating the trains. We have ordered recently quite large fleets of new car-carrying wagons because of the demand from Morris Cowley. With oil, we are running new trains from South Wales, Milford Haven and Llandarcy to Birmingham and Scotland and there are more to come. Chemicals, cement, milk, and china clay—they're all on the increase. I was measuring this down in South Wales the other day and I found that, compared with only a year ago, 16 additional freight trains each way are now running through Cardiff every day.

Allen: Is the principal customer resistance—I presume there must still be some—still largely on grounds of unreliability and unsuitability of the equipment you are using by comparison with road?

Fiennes: With our main full-load traffics I think that there now is very little customer resistance on the score of service. I do a good deal of walking round marshalling yards. The evidence of my eyes, looking at wagon labels, has been supported recently by transit tests and there is no doubt that full wagonloads are probably moving about the country better than ever before. I was in Stoke Gifford yard early the other day and there was virtually no long-distance wagon which had not got yesterday's or the previous day's label date on it; most of them had yesterday's. Where we are still not giving a good service is on small consignments through the terminals—but that is not confined to BR.

"The wagon situation is tight"

Allen: Are you suffering from any shortage of goods vehicles?

Fiennes: The wagon situation is tight. We're not turning away traffic, but we do have to pull the stops out to get empty wagons to the right place. That, of course, is how it should be. It is certainly a problem with coal wagons in particular and to some extent with vans for general goods, but it hasn't been critical or even serious.

Allen: Do you find any resistance on the part of your smaller customers, particularly local coal merchants, to the railhead concept of the new freight era?

Fiennes: Oh yes, lots of resistance.

Allen: Will you overcome it in the fulness of time?

Fiennes: I think that to a great extent it disappears with experience—experience of the best of these depots, anyway, with which traders are very satisfied. Personally, I am not entirely satisfied that the very large concentrations are the right thing. The most successful ones are medium-sized, such as Taunton, where the breakage in the received coal is con-

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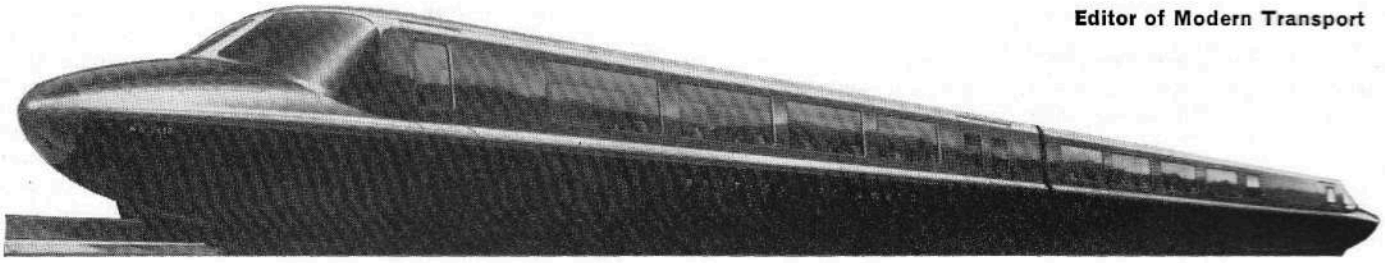
CHARLES F. KLAPPER

Editor of Modern Transport



Tracked hovercraft—a threat to orthodox railways?

FROM the beginning of the twentieth century there have been strong incentives to increase the speed of passenger trains on orthodox railways. Competition or emulation between rival railway undertakings, improvements in motive power, the door-to-door convenience of the motor car and the spectacular achievements of aircraft, have all led to the conclusion that higher speeds are commercially necessary.

One of the pressures towards increased speeds has been the mere existence of a number of high-speed railway schemes—the Lartigue–Behr, the Brennan, the Kearney and others—generally lumped together in the popular mind as monorails, although only the gyroscopically-supported Brennan could truthfully claim that title. Intended primarily for military use this made little impact on the competitive situation, whereas the authorisation of a Liverpool–Manchester line on Lartigue–Behr principles greatly perturbed the hierarchy of the five railway companies interested in passenger facilities between the cities, got a mention for monorails in H. G. Wells's *War in the Air* and frightened the board of the London, Brighton & South Coast Railway into thinking of a suburban electric traction system suitable for extension to the coast, in view of Behr's prospectus for a London–Brighton link at well over 100 m.p.h.

Of recent years the desire for quicker access to airports has stimulated fresh research into rubber-tyred versions of so-called monorails such as the Alweg, straddling a concrete beam and the Safège, suspended from a hollow box girder. Speeds of 100, 150 or 200 m.p.h. have been variously promised by sponsors of such systems and have been matched by top speeds on orthodox railways of 130, 151 and eventually 205 m.p.h. In Japan the target speed for the orthodox standard-gauge New Tokaido line is set at 155 m.p.h., while in Europe 125 m.p.h. is now being seriously pursued by the French, German and Italians.

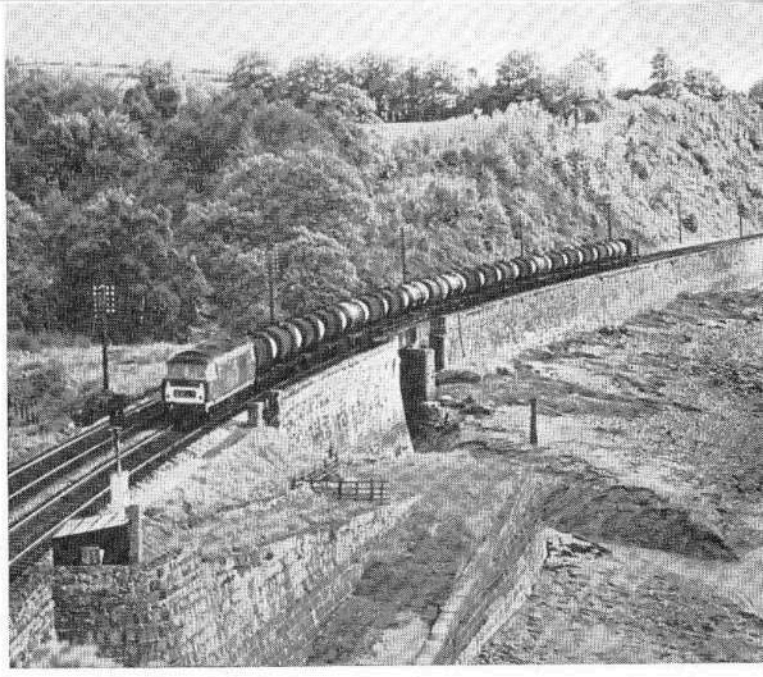
Judging by his frequent references to it, at one time the potentialities of the hovercraft train strongly influenced the attitude of Mr. Ernest Marples, while he was Minister of Transport, to the prospects of British Railways. In real life the tracked hovercraft is still only a threat—in fact, it might even be classified as no more than a vague threat. The frequent reply of Mr. Christopher Cockerell, who developed the hovercraft idea, to any question about its speed capabilities is "How fast is an aeroplane?"

Nevertheless, its demonstration in model form as a hovercraft exhibit at the recent Engineering Industries Association exhibition in London clarified some of the prospective machine's characteristics. If the pattern that emerged was still only tentative it is crystal clear that awaiting some development

siderably less than it was when it was handled in the old way through marshalling yards. The trouble of road-hauling coal 10 miles instead of 2 is something which the merchants don't find quite so bad after experience. Remember that, with the Taunton concentration, the Minehead gasworks thought at first that they would find it impossibly expensive to receive by road because, they said, they wouldn't be able to use bigger than a 5-ton vehicle which could only make one trip a day. In fact, they're using 12-ton vehicles and they're making four trips a day.

Allen: One last question. It is well known that the Great Western excited the fiercest staff loyalty of any of the "Big Four". Has this made it any more difficult to enthuse your staff with the image of a new and modernised Western Region?

Fiennes: The staff have undoubtedly retained a very strong Great Western image—and a glorious image it was. The Great Western before the war had a towering reputation for safety. They had the fastest trains in Britain and were at the top for punctuality, comfort and courtesy. What is more, they were the only company which continued to make profits and pay a dividend throughout their long history. In some respects that performance has fallen away: the North Eastern has the record for speed; Scotland is at the top for punctuality; and the Western is certainly not at the top for profitability. When those particular standards of performance are restored, we can say that the Western is once again Great. In the meantime, of course, some of the staff don't entirely like the means which are being adopted to restore them to their former glory, but in about 18 months' time I think everybody will be able to see the point.



"We are running new oil trains from South Wales to Birmingham and Scotland and there are more to come." Empty oil tanks from Rowley Regis to Llandarcy, Swansea, skirt the bank of the River Severn between Newnham and Lydney behind "Hymek" diesel No. D7032 on May 9, 1964.
Photo by B. J. Ashworth

work there is a form of passenger transport which is potentially a devastating competitor, not only to orthodox rail travel in the 100 to 600 miles range, but also to the aeroplane in the same range, seeing how much an air journey between any given pair of city centres is protracted by the toilsome passage between city and airport. Mr. Cockerell offers at least as much threat to the railway of 1980 as Mr. Behr held in 1902 for the railway of 1910. The difference is that a prototype of the Behr concept had been worked at up to at least 98 m.p.h., whereas claims for the tracked hovercraft are so far based only on experiments with a test rig established by Hovercraft Development Ltd.

The next stage is to test the idea on a short length of track and then probably to provide a two-seat vehicle for runs of up to 5 miles on a straight route. For this purpose negotiations have begun with British Railways to find a suitable length of straight and level disused line with no level crossings. The maximum speed characteristics can then be tested and braking investigated to overcome the aversion of the Ministry of Transport railway inspectorate to untried unorthodox variants of the standard railway. From success thus far the promoters propose routes of increasing length before tackling the longest interurban routes in Britain or on the Continent.

A curious feature of the proposals is a fear of junctions, common routes or, unless they are avoidable, any intermediate stops. This stems from a desire to assess end-to-end traffic, say from London to Edinburgh or Paris to Stuttgart, fix the economics and design a vehicle suited to that particular route. No doubt before anything is actually built someone will have pointed out that the canal companies of the eighteenth century did precisely this and prevented a truly national and universally-usable network becoming available.

The proposed track structure would be of shallow inverted V form and made from concrete, probably with a surface placed on it which could be planed smooth. The vehicles would be elevated on an air cushion about ½in deep and would be guided by the form of the track, although side air pads are also a possibility in view of the hovercraft's susceptibility to side wind thrust. The vehicle would be streamlined and in all probability a degree of boundary-layer control would be incorporated to reduce drag by using a circumferential air intake at the rear end of the bodywork.

At 300 m.p.h. it is thought impossible to operate in trains of vehicles, although this could be done on shorter routes where lower speeds might be viable. Mr. Cockerell told me that his ideas on the length and size of vehicle were very flexible and that a vehicle of considerable length might be employed if straight track could be secured for the high-speed portion of a run. To enter cities the sharper curves of orthodox railway practice might have to be accepted, so as to place the hovertrain route over an existing approach to a terminal. Apart from an assumed weight of 43 tons for a 150-seat tracked hovercraft, details of dimensions are sparse, but as a vehicle capable of holding a motor car transverse to the track was illustrated in the scheme's propaganda, it seems that Mr. Cockerell is even less trammelled than the late Mr. I. K. Brunel, as this implies a vehicle at least 15ft wide.

Whether this is envisaged as the vehicle for which the precast concrete track, complete and placed on supports above the ground ("to prevent hooligans throwing bricks or perambulators on the track, with its consequent dangers of turning them into missiles if a car hit them at 300 m.p.h."), is expected to cost only £250,000 a mile, is not clear. The London–Glasgow route of roundly 400 miles in length was likely to cost £100m, according to Mr. Cockerell. The track, in view of the need already mentioned to avoid appreciable curvature, vertical or horizontal, would have to take an entirely new route across country and its sponsors make the usual point advanced by high-speed railway advocates that by the phenomena of momentum, steep gradients make less difference to a train at 300 m.p.h. than they would to one plodding along at 50 m.p.h. What sort of costs would be involved by an elevated structure in broken country is a chancy speculation; only actual surveys would prove how much reliance could be placed on swings and roundabouts keeping the average cost reasonable.

Signalling would be completely automatic and coupled to the controls on the train, in view of the difficulties of visual signalling at the proposed speeds. By cutting off the air supply to the air cushion an emergency stop could be made by letting the train down on to its concrete track. As a memorandum on the proposals states, "suitable friction pads attached to its underside" would probably be needed on the vehicle. Normal track wear is expected to be negligible. Propulsion is suggested as being by linear motor and normal stops could be made by its reverse thrust characteristics.

Economics appear hazy and are clouded by rather peculiar assumptions made about orthodox trains in a table issued by the BP group in respect of the tracked hovercraft. With the obvious problems calling for solution it may be assumed that some years have yet to pass before the new competitor makes much impact on the steel rail railway.

THE ER'S NEW DIESEL DEPOT AT TINSLEY

THE Eastern Region's new diesel locomotive maintenance depot at Tinsley is now in full operation. Part of the comprehensive plan for rationalisation and modernisation of all railway facilities in the Sheffield area, it adjoins the new Tinsley marshalling yard, which comes into use this summer, between Shepcote Lane and Catcliffe. It is the principal maintenance depot for a wide north-western area of the ER.

The depot stands high above the reception roads of the new Tinsley yard at the original ground level in this area. Looking down on to the layout of the 3-mile long yard below, the expense of the earthworks necessary to clear a site for it are easily imaginable. As a result of this substantial difference in levels the double-ended depot has to be approached at each end by a very steep "dog's-leg" connection from the yard.

There is a maintenance area at each end of the depot with a central section of offices, workshops, canteen, mess rooms and staff amenities. Previous ER practice has been followed in the layout of the maintenance area, except that the twelve tracks, six at each end, are long enough to berth only two locomotives at a time. This is regarded as an improvement on the three-berth arrangement at Finsbury Park depot, for example, as it reduces interruption of work on a locomotive at the outer end of a berth when one inside needs to be moved into the yard. Another change is that the headroom below the concrete working platform has been increased to 6ft 8in. These platforms are 4½ft above rail level; the general floor level is 3ft below the level of the rails, which are supported on short steel columns; and the inspection pit level is 4ft below rail level. There is adequate provision for dispensing fuel and lubricating oils, radiator coolant and boiler water to locomotives under maintenance, and for piping away waste sump oils to a central storage area for eventual disposal.

All twelve locomotive berths at one end of the shed have access to a crane. The centre four tracks are spanned by an electrically-driven transporter crane of 1-ton capacity and the remaining two outer tracks by a separate, hand-operated 1-ton transporter crane. Two more cranes of the latter type are installed over the two outer tracks only at the other end of the shed. The comparatively limited capacity of these cranes serves all planned purposes, for no engine lifting is carried out at the depot. It has the facilities to undertake a locomotive's first intermediate examination, but does not dispose of the staff for overhauls as well as its scheduled maintenance work. The biggest operation undertaken in the depot is a change of cylinder liner seals.

Fume extraction is a problem

For air-operated tools and equipment, compressed air is piped throughout the shed to each locomotive berth and also to the workshops. Following a policy which has been successfully adopted for other ER diesel depots, a high-pressure hot water system provides the space heating and functions automatically. Fume extraction equipment, consisting of 48 2ft-diameter electrically-driven fans, is controlled from four points, two at each end of the shed. To overcome past difficulties with diesel fumes in locomotive depots, a system of mechanical fume extraction has been employed, related to the position of locomotives in the berths. The fans are installed in pairs across the roof and positioned equally about the centre line of each locomotive berth, so as to ensure that the fumes, as soon as they are emitted, are boxed in between two rows of fans and the chance of air pollution at the working level is reduced. To increase the rate of extraction, pneumatically-controlled air inlet louvres are built into the shed walls to create a through flow of fresh air. Depot lighting is fluorescent and a number of electric socket outlets are provided at the locomotive berths for the connection of welding plant, battery chargers, tools and so on; there are also 110 volts supply points to feed the internal lighting of the locomotives.

In the central area of the depot, the workshop space is about 90ft square and can be divided into sections by demountable screens. The main store, which caters also for the outlying servicing depots used by Tinsley locomotives (*see below*), is close by. Stores material off-loaded from road or rail vehicles can be transported into the building by one of two pulley blocks, travelling on overhead joists which pass into the workshops and stores. An electrically-operated lift serves the floor above, which is occupied by staff accommodation, including a canteen, kitchen and messroom, and also by offices for work study staff and locomotive contractors' representatives. There is a subsidiary store at the lower ground floor, 4½ft below rail level, where the depot's main entrance is situated; this is linked by short ramps to the working floor of the depot.

The depot equipment includes a two-stage locomotive washing machine, in which the first stage is a solution application and the second a water wash. Its effectiveness is demonstrated by the one locomotive, employed on a local Brightside Wharf freight duty, for which the Tinsley depot undertakes all servicing as well as maintenance; this passes through the washing plant every day, whereas other units are washed only when they come on to the depot for maintenance, and its sides are immaculate, although the device cannot deal satisfactorily with the cab ends.

Freight work makes for greater reliability

On the average, 10 locomotives undergo their scheduled maintenance on each shift at Tinsley. The depot's allocation is currently 159 locomotives, comprising the following: 23 English Electric Type 1s; 3 Clayton Type 1s (of an eventual allocation of 13); 32 Brush Type 2s; 33 Brush Type 4s (which include a growing number equipped with air brakes and the Hawker-Siddeley slow-speed control for merry-go-round coal working); 36 English Electric Type 3s; and 32 350 h.p. diesel shunters. Overall availability is running at about 85 per cent and the differences in performance of individual types in this respect is being narrowed.

The high proportion of freight work in the rosters of Tinsley's diesels is undoubtedly a factor in the reliability now being secured from the depot's allocation. Its locomotives are not susceptible to some troubles affecting other ER main-line locomotives, which spend the greater part of their working life at full power and high speed on the East Coast route express service. The reverse of the picture is the higher incidence of tyre wear on the Tinsley locomotives as a result of their considerable unbraked freight work and colliery duty.

Tinsley has several subsidiary servicing depots in the territory its locomotives cover. One is being established in the adjoining Tinsley yard. There is another in the Sheffield area at Darnall, but this was built originally for diesel multiple-unit care; the multiple-units are now serviced at Lincoln and the long-term necessity for retention of this establishment in its new guise as a locomotive servicing depot is in question. As well as being a servicing point, Wath also maintains 40 Brush Type 2 locomotives; this was originally a Manchester–Sheffield 1,500V d.c. electric locomotive depot, but motive power maintenance for this electric line is now an LMR responsibility and the continuance of maintenance activity at Wath was probably agreed because of the existence there of trained staff. A further servicing depot is currently under construction at Shirebrook West and another is to be built at Barrow Hill; it is understood that Tinsley's Clayton Type 1s will operate from the latter.

Liaison with the Movements Officer

Nowadays the Depot Master of a maintenance shed is not concerned either with the employment of his locomotives or with the engine crews using them. His task is to supply the Movements Officer with reliable locomotives, fully maintained, and to minimise the unavailability of motive power by restricting the duration of his retention of locomotives for

TINSLEY DEPOT AND ITS LOCOMOTIVES

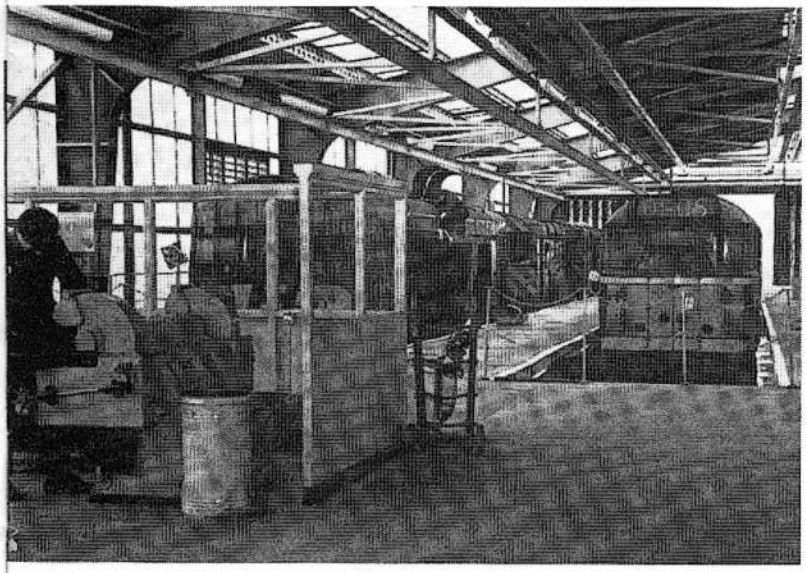
Right: An English Electric Type 3 diesel of Tinsley depot, No. D6806, approaches Peterborough North with a King's Cross–Grimsby and Cleethorpes express.

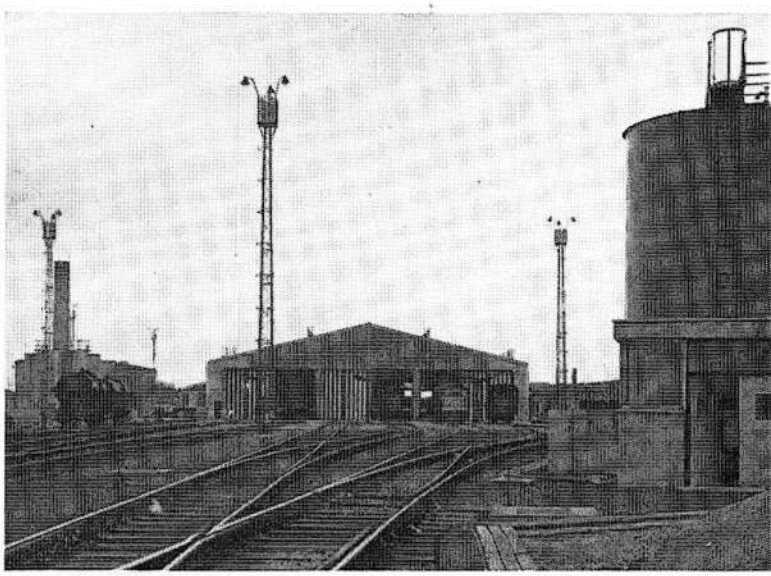
Centre left: Inside Tinsley depot, looking towards the western end of the shed from the workshop area.

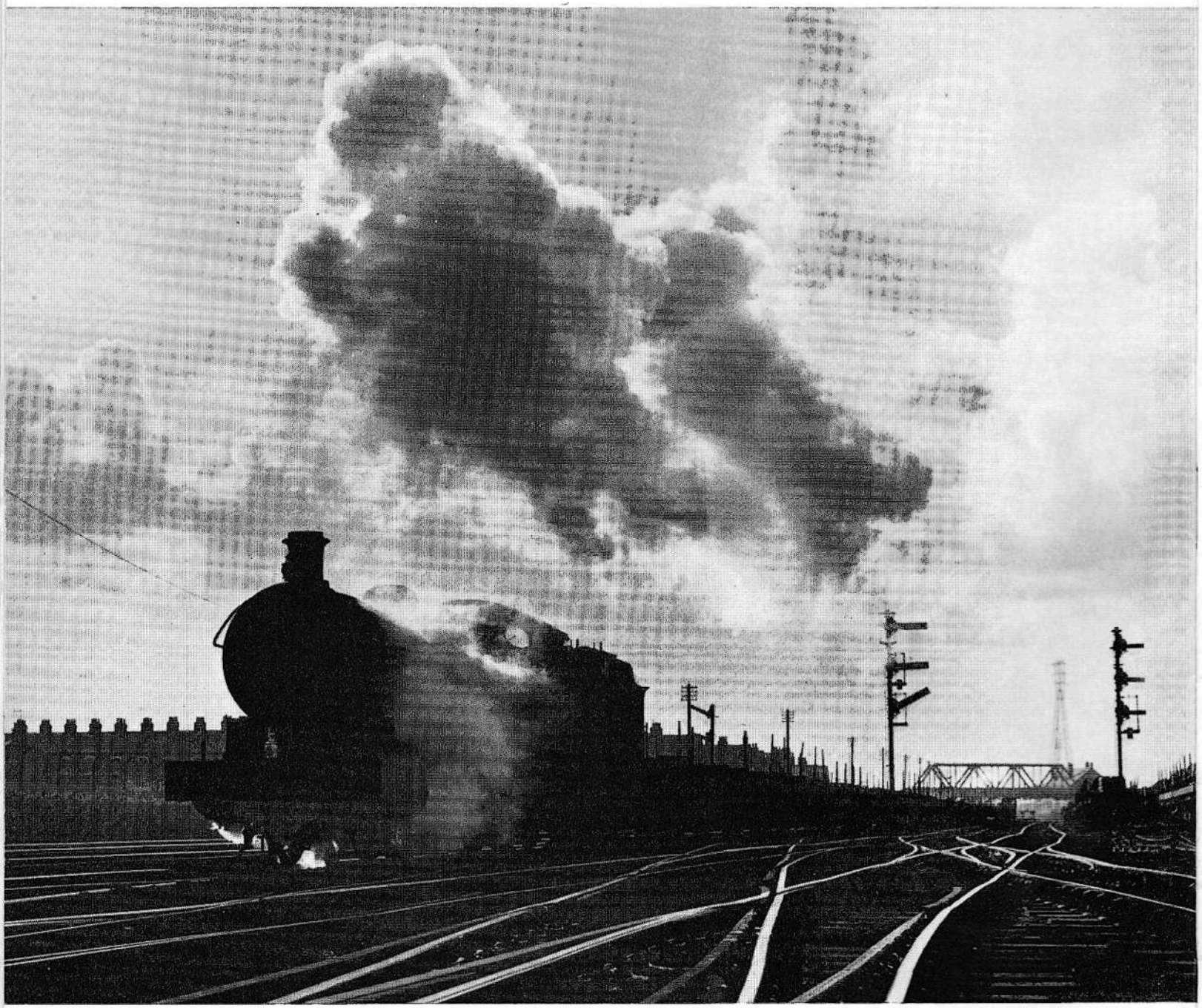
Centre right: The exterior of the western end of Tinsley depot, with fuel storage tanks on the right.

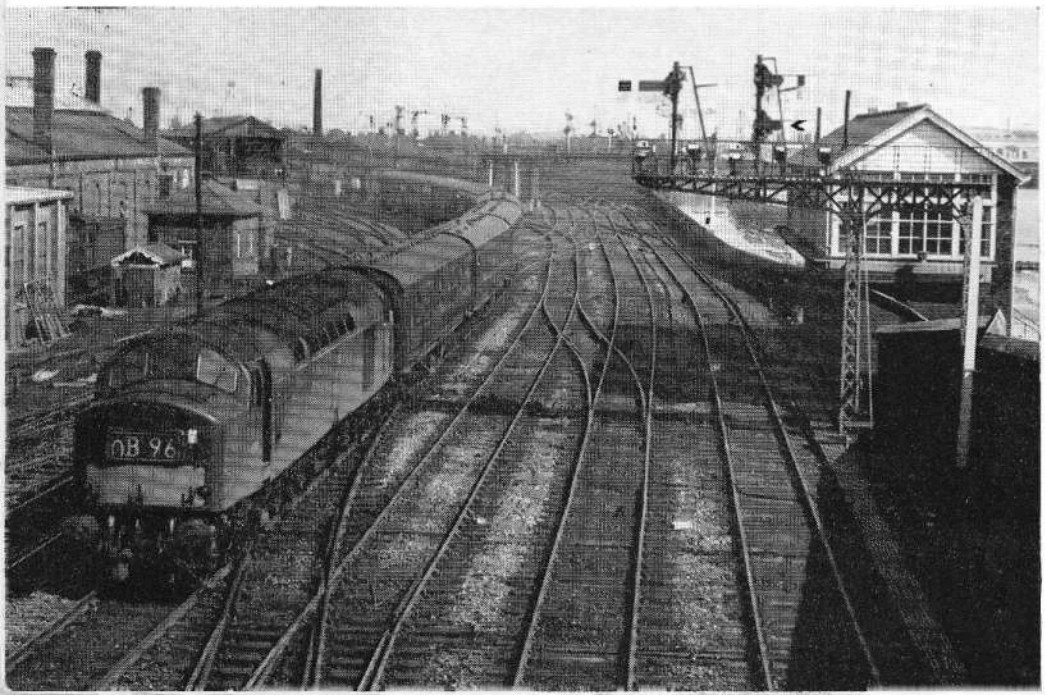
Bottom: A Brush Type 2 diesel of Tinsley depot, No. D5845, heads mineral empties over the LDEC route near Ollerton; on the left is Class O4/8 2-8-0 No. 63732.

Photos by Eric Treacy (right), British Railways, C. T. Gifford (bottom)









Above: Many of the surviving Class Q6 0-8-0s of the NER have had to be given a lengthened lease of life because changes of BRB diesel allocation policy have cut the NER's 1965 share of new diesel locomotives, in order to complete dieselisation of the ER and WR as soon as possible. This Q6 was photographed on empty bogie bolsters at Middlesbrough. **Left:** English Electric Type 4 diesel No. D385 passes West Hartlepool motive power depot with a Newcastle–Colchester train in April, 1964. *Photos by C. T. Gifford, J. Appleton*

NORTH EASTERN POWER CONTRASTS

maintenance purposes. The Tinsley Depot Master's day-to-day link with his Movements Officer is provided by his own foreman and a diesel locomotive controller in the Sheffield Victoria traffic control.

The records maintained by the depot are concerned exclusively with whether or not each locomotive is faithfully observing its maintenance schedule. The day-to-day allocation of individual locomotives to work diagrams is the diesel locomotive controller's responsibility, with a proviso that the depot must of course be supplied with any necessary information on locomotive mileage and engine-hours relevant to accurate determination of a unit's maintenance needs. The controller maintains a chart showing the use of each Tinsley locomotive from day to day, with details of the diagram worked, mileage, etc. Each morning he receives by phone from Tinsley a list of the locomotives which, according to the depot's records, are imminently due for maintenance examination and it is the controller's job to ensure that his rostering secures their despatch to Tinsley on time. In addition to written records, there is a peg-board chart in the foreman's office at Tinsley which shows at a glance the maintenance record for each locomotive over the previous few weeks and when its next examination is due.

Tinsley diesels work far afield

The work of Tinsley-based locomotives is wide-ranging. For example, six Type 4s and three Type 2s on Shirebrook West servicing depot diagrams cover the Class 7★ mineral trains over the former LDEC route between Mansfield and Whitemoor or New England. Type 4s work to Birmingham on the through steel trains between Frodingham and South Wales and there is a daily Type 4 duty to Banbury. The depot's English Electric Type 3s cover the Grimsby and Cleethorpes–King's Cross express service. The High Dyke-Frodingham iron ore traffic is integrated in a complex series of diagrams covered by Tinsley depot. Now that Tinsley supplies a Type 4 to stand as passenger train pilot at Doncaster, one of its locomotives may find its way to Scotland as replacement for a defective unit on an East Coast express. Most of the diagrams fulfilled by Tinsley locomotives are of a day's duration, but some are spread over two days, while the locomotives on the High Dyke–Frodingham working are exchanged once a week.

The depot's chief problem is the retention of its staff, totalling 150 men or so, in an industrial area where the competition for skilled labour is intense. Some steelworks in the Sheffield area have been offering trained fitters a basic rate of as much as £20 a week, plus generous overtime; in another instance, skilled men have been enticed with fringe benefits that include a lodging allowance of about £3 a week, even though the recipient may live within walking distance of the plant. In summer, too, the building industry comes strongly into the market for skilled labour. As a result, the depot authorities cannot escape a rapid turnover of staff, although they are managing to retain the allegiance of a substantial nucleus; many of these are former steam maintenance men who have made a highly successful transition to become diesel fitters of the highest calibre.

The NER's Gateshead shed becomes a diesel depot

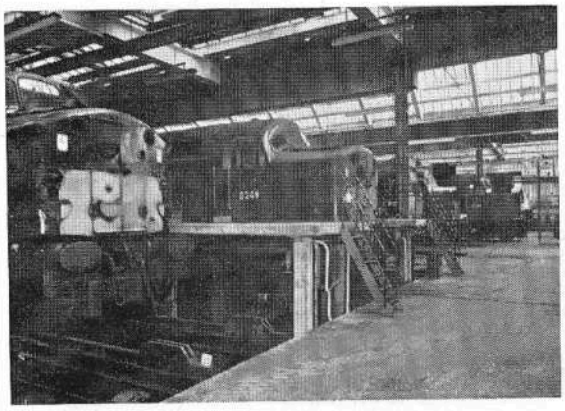
THE reconstruction of Gateshead motive power depot, which has been in progress for 18 months, is now virtually complete. This was the second stage of an overall plan to extend the facilities at the depot and equip it to service and maintain diesel locomotives. The chief aims were to separate work on diesels from that on the remaining steam locomotives and to provide separate facilities for daily inspection, servicing and fuelling as distinct from maintenance.

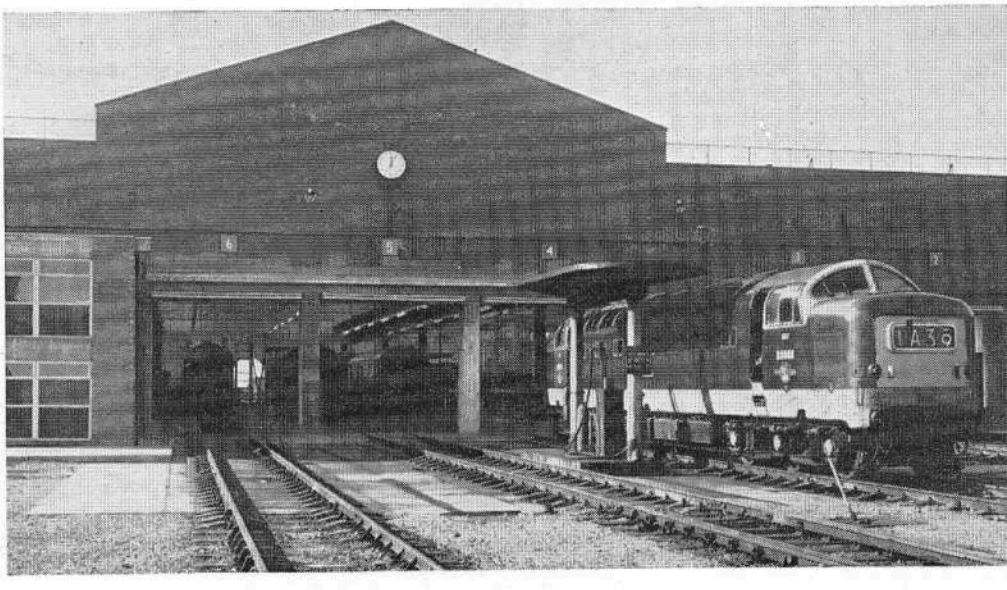
A new inspection and servicing shed is 80ft long and 25ft wide, and has one pitted line and a canopied fuelling line. It is reached by a new connection from the down main line at the west end of the depot. Fuel and water points have been installed in openings in the south wall; these can be utilised either inside or outside the shed, so that locomotives requiring only fuel and water can be dealt with on a line which by-passes the shed on the south side. To facilitate inspection and servicing, the floor is set 15in below rail level and a fixed platform is provided at footplate level.

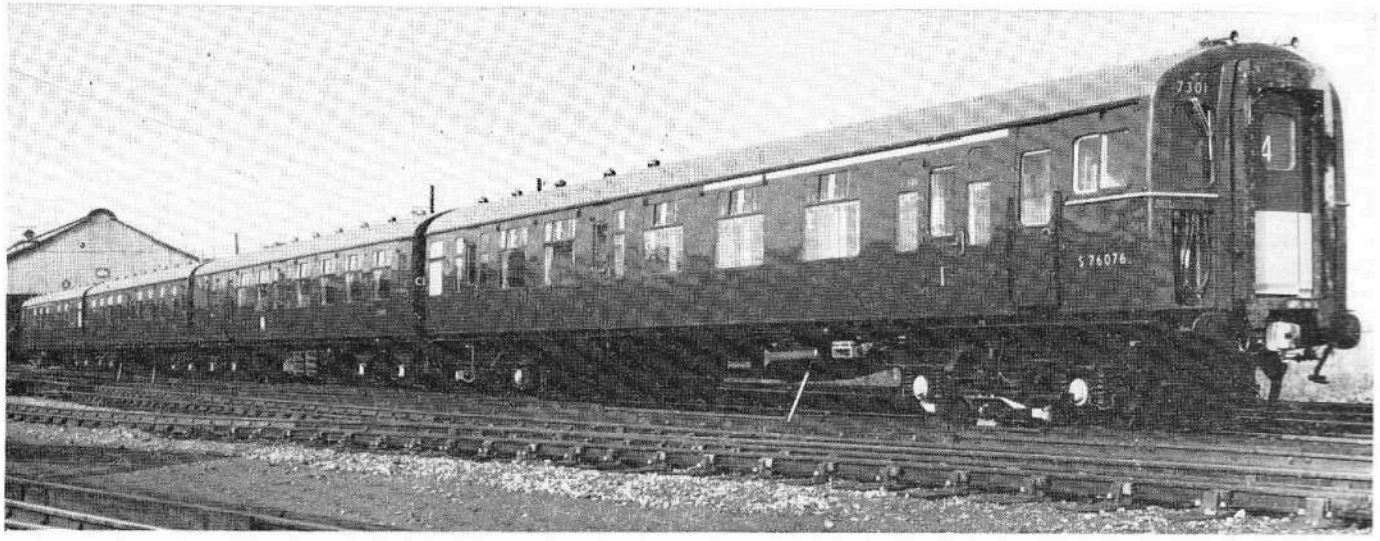
A portion of the existing shed, 165ft long by 180ft wide, has been altered to form a maintenance and repair shed. The turntable and radial pits have been removed and replaced by five straight pitted lines, each approximately 160ft long. Extensive alterations have been carried out to the east gable of this shed to give access to these new lines and new openings have been cut and fitted with hand-operated vertical lift folding leaf doors. The southernmost bay of the shed has been converted into a lifting bay and equipped with a 6-ton capacity gantry crane to lift heavy components from diesel locomotives. At the north side of this shed, a one-ton capacity overhead runway has been installed to serve one of the two existing pitted lines. These lines have platforms at footplate level and will be used mainly for maintenance of "Deltic" locomotives.

A good deal of associated permanent way alteration has been carried out with the aim of ensuring the free flow of locomotives through the inspection/servicing shed, direct to the down main line at the east end, to stabling, and to the diesel maintenance and repair shed. A new two-storey office building, integral with the east gable, has also been erected.

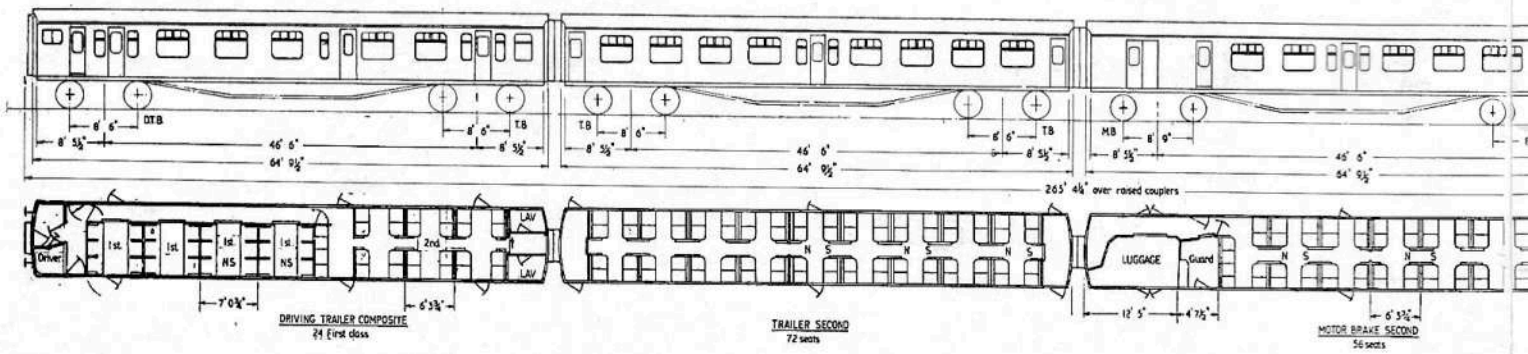
Interior and exterior views of Gateshead motive power depot following the reconstruction of part of the former steam shed as a diesel maintenance and repair shed. *Photos by British Railways*





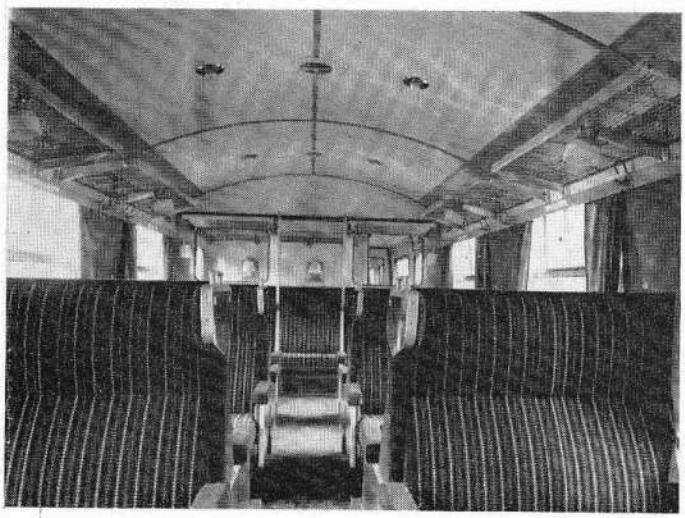


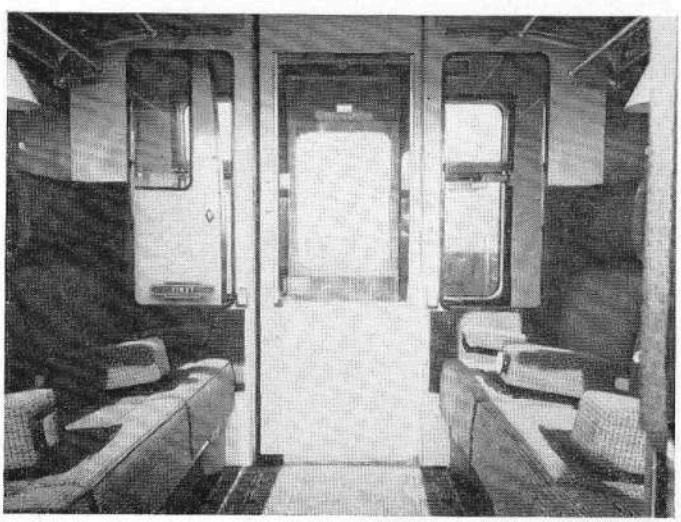
The SR's new Brighton express units



The Southern Region has released full details of its new 90 m.p.h. 4-BIG and 4-CIG electric multiple-units to replace existing London-Brighton express stock. The latter has been in continuous service since January 1933, and each unit of it has run approximately 3m miles.

A general view (**above**) and second-class saloon and first-class compartment accommodation (**below**) of a new SR Brighton express unit. One of these sets was recently engaged on high-speed riding trials between Haywards Heath and Three Bridges, which included a 7min timing start to pass for the 8.45 miles in each direction.





THE 54 new four-car Brighton express units are being built at York carriage works. Each has only one motor coach, mounted on two motor bogies, which is a non-driving vehicle marshalled inside the unit. Driving trailer composites are the end vehicles of each set.

Much of the traction equipment is interchangeable in detail with that of the Kent Coast stock. The four English Electric Type 507 traction motors per motor coach, each of 250 h.p. 1-hr. rating, give a balancing speed of 72 m.p.h.; continuous rating is 280 amps, 675V, 235 h.p. Standard English Electric air-oil camshaft equipment is used for the main controller. The control and auxiliary circuits follow previous practice, being fed from a motor-generator with 750V d.c. input and 70V d.c. output and an alkaline battery of 45 amp-hr. capacity, but to guard against a reverse flow of power through the motor generator a rectifier diode replaces the reverse current relay previously employed. Control and protection equipment for the auxiliary circuits—lighting, heating, compressors, etc.—is accommodated in a cupboard adjacent to the guard's van in the motor coach.

The driver's cab layout is similar to that of the Kent Coast stock, but it has an improved knee-hole desk featuring a redesigned instrument panel, with flag-type indicators based on modern aircraft practice, in place of the coloured-light type used on all post-1951 stock. Red illumination of the instruments has been adopted to secure brightness without impairing night driving vision. The emergency control selector switch has been replaced with a network of diodes to ensure that a control supply is available from any of the three motor coaches in a 12-coach train. Special attention has been paid to draught prevention in the cab and an electric heater has been incorporated in the driver's footrest.

The motor coaches are mounted on improved Mark IV motor bogies, which are interchangeable with those of the Kent Coast Phase I and II units, but the new vehicles' bogies have the latest design of Hoffman roller bearing axleboxes, fitted with a ball bearing end thrust race in place of the earlier phosphor bronze thrust pad. The trailer bogies are close relations of the B4 type standardised for BR locomotive-hauled stock. Some modification of the basic design was necessary to deal with the heavy overloads to which the stock will be subjected and to adapt it for use at the cab ends of the driving trailers, where it is equipped with shoe collector gear; the latter is beamless and specially designed for application to this bogie. The coil springs of the bogie bolster have two rubber springs to assist with overloads. Vertical swing links on hardened knife-edged mountings permit lateral movements between the bogie and the coach body, which are cushioned by beehive-shaped rubber springs. In addition, vertical and lateral oscillations of the bolster are hydraulically damped.

The electro-pneumatic and automatic air braking is different in some respects from previous SR equipment, but fully compatible with all existing stock. The principal difference is in the driver's controller. This is of the three-position type, in which the same working sector of the handle is used to control either e.p. or automatic brake applications. When the e.p. brake is in operation the automatic brake is locked out of action by a magnet valve. Any loss of supply to the e.p. brake during braking causes this valve to de-energise and an automatic brake application of comparable value to be made without further action on the driver's part. The brake controller is self-lapping in both e.p. and automatic brake modes of operation. The electro-pneumatic valves are of a newly-developed, direct-acting type which has the advantage of small size without the complication of relay valves. The triple valve is also of diaphragm type, with the object of eliminating the skilled fitting operations necessary to maintain the traditional pattern. An innovation is the remotely-controlled handbrake, operated by electric switches in the driver's cab and applicable to the whole train when battery power is available. There is also an orthodox handbrake wheel which applies the brake on the leading coach only.

The driving trailer front-end has been styled in collaboration with the BRB Director of Industrial Design. The Pullman-type gangways are shrouded by metal aprons, projecting from the body ends, which conceal and protect the rubber gangway diaphragms. The gangway doors have been brought as far forward as possible to minimise the cavity within the gangway. These doors have been manufactured by the BR Workshop Division at Eastleigh in polyester resin-bonded fibreglass to a new design embodying the latest pattern of route indicator. Also new are the recesses on either side of the gangway to house the electrical jumper connection and e.p. brake cocks and couplings when they are not in use.

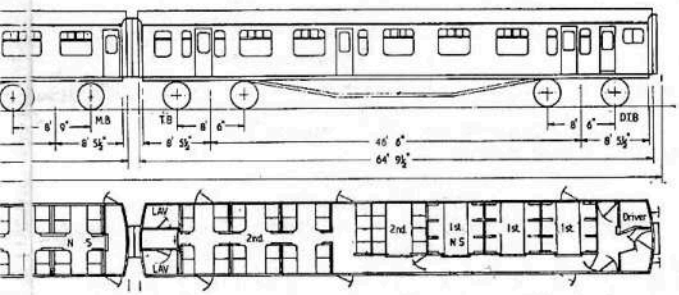
The coach floors are laid on longitudinal steel corrugated sheeting, which has been welded to the top of the underframes and insulated above and below with sprayed asbestos. The underside of the roof panels has also been sprayed with ¾in-thick asbestos. The bodysides and ends have been insulated with glass fibre, which completely fills the cavity between the steel outside panels and the interior finishing panelling.

The bodyside doors are also in glass reinforced polyester, and to obviate draughts their frameless windows are sprung to close slowly and automatically when opened, except for those fitted to the single entry door of the first-class compartment on each driving trailer composite. Ventilation is provided by sliding lights in the bodyside windows and the door droplights are fitted chiefly to allow access to the external door handles. The bodyside windows are double-glazed.

The electric train heating is fed at line voltage (750V) and in all second-class saloons is controlled by a master thermostatic control in the motor coach. Individual adjustable thermostats are provided for passenger operation in the compartments. The thermostats in the motor coach are arranged so that heating is not full on unless the temperature falls below 50 deg. F.; between 50 and 60 deg. it will be intermittent and above 60 deg. it will be switched off. The compartment thermostats are transistorised and should control temperature more accurately than past apparatus.

The driving trailer composites are of identical construction, but in half of them the innermost compartment is temporarily fitted with second-class seating, thereby reducing the number of first-class compartments per unit to seven and initially providing 42 first-class seats per unit. It will be simple to increase the ratio to eight first-class compartments per unit at some future date if this proves commercially desirable.

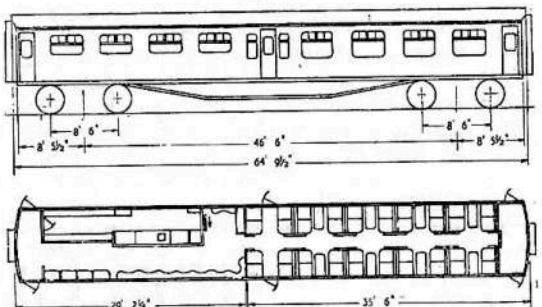
Of the 54 units, 18 will be 4-BIGs, incorporating a buffet car in place of the trailer open second. The new buffet cars will have the same body structure as that of the trailer open seconds, but inside the body the buffet will occupy the space of the smaller open saloon. As the new units all have gangways at both ends, a single buffet car will be able to serve a complete train formation, which was impossible with the previous Brighton stock. These cars will be late in delivery because at



DRIVING TRAILER COMPOSITE
18 First class
36 Second class

◀ 4-CIG unit

4-BIG buffet ▶



BUFFET CAR
40 Second class seats

Our industrial design correspondent writes:

In general the interior design of the new Brighton stock follows the style introduced by Eastleigh for the East Kent CEP stock. However, altered layout of the carriages has resulted in some modification to second-class seating arrangements, involving the use of some four-abreast seats, set against the partitions between saloon and compartment, close to the doorway. Upholstery and other furnishings remain the same as that introduced in the Kent stock, but changes have been made in the luggage racks and light fittings. Although the designers have at last taken the sensible precaution of moving ceiling lamp bulbs further away from the luggage racks—thereby reducing the risk of them being smashed by bulky suitcases—the new design of rack and mounted shoulder light is not very pleasing. Indeed, one wonders why fluorescent lighting could not have been standardised for these new sets, with the use of tungsten bulbs confined to small individual reading lights only. The shoulder lights above the four-abreast seat in the second-class saloons are particularly unsatisfactory visual features.

Externally, the front end design has been improved somewhat by giving a slight radius to the angle between bodyside, roof and front panels, and by tidying up the cab handrails, jumper cables and gangway. Nevertheless, one can only re-echo the view that, having produced a new front-end for the Clacton multiple-units, York should have applied it to this stock for consistency of style. The new SR design was preferred because it was cheaper.

one stage, in the economy drive that killed a number of SR buffet services early in 1964, it was decided to have no refreshment vehicles in the new Brighton stock. Policy was reversed too late to complete design of the buffet cars and build them for introduction simultaneously with the remainder of the stock.

Four seat-rests will be fitted to the bodyside opposite the bar counter and sheltered by a draught screen at each end. A continuous shelf with a scalloped front edge sufficiently wide for plates, with a small handbag rack below, continues along the remainder of the bodyside opposite the kitchen. Cooking facilities in the kitchen will be modest, but they will include frying and griddle plates and a four-hole egg poacher.

The interior decor of the buffet has been specially created by the Director of Industrial Design, BRB. The outer walls of the kitchen will incorporate in their panelling a design based on the word "BUFFET" in a variety of colours on a white background. This will be set in a 2ft 6in strip on an overall pattern of grey stripes in different shades and widths, running horizontally. The floor is to be covered by 1ft-wide strips of black, brown and white linoleum, and the counter and shelves with blue-grey check plastic, while the seat covering is to be royal blue.

The decor of the new stock is otherwise similar to that of the Kent Coast units. In the first-class compartments of the driving trailer composites the bodyside panels below and on either side of the window are in green plastic matt finish with a narrow glossy black panel immediately below the window-sill for ash-trays and table mountings. The ceiling is panelled in off-white plastic and the partition over the seat back is in melamine-faced walnut veneer. Upholstery is uncut moquette of charcoal grey with a turquoise pattern and the curtains are black-striped orange.

In the second-class open saloons, the plastic bodyside panels below and between the windows are in steel blue with a narrow black panel immediately below the window sill for the ashtrays and table fittings. The panelling above the windows and the ceilings is in off-white plastic, and the transverse partitions at the saloon ends are white. Second-class upholstery is dark grey uncut moquette, patterned variously in red, yellow, light blue, black and white. Seat ends are panelled in green plastic, edged with aluminium mouldings. The bodyside luggage racks are of a new design with stainless steel grids instead of cord netting to improve appearance and reduce maintenance. They have a lamp fitting in the underside immediately over the centre of each double seat back.

Train Running and Traction Performance

Cecil J. Allen

GREAT EASTERN LINE: TAUNTON—PADDINGTON: "BRISTOLIAN"

TO readers who hitherto have followed the "Locomotive Running Past and Present" series the above title will be unfamiliar. Since MODERN RAILWAYS, as compared with its predecessor *Trains Illustrated* in which this series began, concentrates on the present and future rather than the past, these monthly articles must logically conform to the same pattern. Actually they have done so for a good while, so that in any event the former title has not been fully appropriate.

Recently I had a letter from a reader, Gerald P. Usher, who lately returned to the Great Eastern after a long absence. "It is the 'feel' and general atmosphere of the GE which is so new to me," he writes, "and which has left a profound impression of good management and competence that is deeply satisfying. Suffice it to say that in seven days of travel almost every train that I rode on or saw was dead on time. I can pay no greater tribute to the Great Eastern than this." While this eulogy is justified by the operation of the Clacton electrics, for the time being Great Eastern timekeeping in general is not up to this perfect standard.

Enclosing some records of typical performances by the Clacton multiple-unit electrics, my correspondent adds, "I had seen several logs of performances by standard eight-coach sets and was aware that the ten-coach formations were considerably more powerful, but the difference between the two I found to be almost startling". The facts are these. Each motor-coach is equipped with four 282 h.p. GEC traction motors, giving a total h.p. of 1,128. An eight-coach formation, including buffet car, has a tare weight of 335 tons, and with the two motor-coaches the driver has at his command 2,256 h.p., or just over 6.7 h.p. per ton of train weight. With a ten-coach formation, however, while the tare weight increases by just over 29 per cent, to 434 tons, the h.p. goes up by 50 per cent, to 3,384—that is, to 7.8 h.p. per ton of train. In other words, the total installed power of one of these Great Eastern ten-coach sets is greater than that of a "Deltic" diesel. It is possible, however, that the high power-weight ratio of the former was adopted at least partly to gain experience with an eye to possible use of electric multiple-units on the services out of Euston after electrification.

With the help of this outstanding power output, the Great Eastern Line, as is generally known, has standardised average start-to-stop times which not merely are the fastest in the country over such short distances, but so far as I am aware have no parallel anywhere else in the world. These include

working times of 8½min over the 9 miles 46 chains from Shenfield to Chelmsford (67.6 m.p.h.); 8min for the 8 miles 66 chains from Chelmsford to Witham (66.2 m.p.h.); and 11½min for the 13 miles 7 chains from Witham to Colchester (68.3 m.p.h.). In the reverse direction the corresponding allowances are 9½, 8½ and 11½min respectively.

A typical performance of a 10-coach set on starting from Colchester, on level track for ¼-mile, then rising at 1 in 563 for the next mile, 1 in 165 for a mile after that, and finally at 1 in 128 past Stanway, is to be still slightly accelerating on the last-mentioned grade to over 80 m.p.h.; as the annexed Table I shows, it is possible to record a time as short as 2min 45sec over this initial 2.7 miles to Stanway and 4min 23sec for the 5.0 miles to passing Marks Tey. In the dip between Stanway and Marks Tey a speed of over 90 m.p.h. is attained easily and were the controller kept full open there is little doubt that the rate at the foot of the 1 in 222 to Kelvedon could easily rise to well over 100 m.p.h. Three-figure speeds are certainly not unknown between Colchester and Shenfield, but in general the motormen pay due regard to the 90 m.p.h. "ceiling"; I have not personally clocked any higher speed than 92 m.p.h.

The four runs in Table I were timed by Mr. Usher. As will be seen, on all of them the 90 m.p.h. limit was slightly exceeded, though only on the last to any substantial degree. If the limit is generally observed, there is little or no margin for any recovery of time lost by out-of-course checks. However, on the down journey there is an ample margin for recovery between Colchester and Clacton, and on the up also some recovery is possible between Shenfield and Liverpool Street if the train gets a clear road over this densely occupied stretch. Shenfield, notwithstanding the burrowing junction of the Southend branch, imposes quite a few signal checks, especially in the up direction.

No leeway in timings for Type 2s and 3s

Continuing now with diesel performance on the Liverpool Street–Norwich trains, we find that their sharp timing also leaves a little margin for lost time recovery when the standard nine-coach loads are hauled by 1Co-Co1 English Electric 2,000 h.p. units, but the Great Eastern allocation of these is no more than ten, Nos. D200 to D209 inclusive. With the English Electric Type 3 Co-Cos, a h.p. of 1,750 only cuts things a good deal finer. Indeed one cannot help thinking that the Great Eastern, with its very tightly knit services in the London area, which can be easily upset if main-line trains, having a lower capacity for acceleration than the electrics (the Clactons in particular), enter the most congested area at Shenfield from the east even a little behind their booked times, deserves a more generous supply of the higher-powered units to this extremely live sector of British Railways. However, the appearance on Great Eastern metals of Type 4 Brush-Sulzer 2,750 h.p. Co-Co units, now under test, foreshadows some much-needed relief. Meantime, with the Brush 1,365 h.p. A1A-A1A units of Type 2, the London–Norwich schedules are barely capable of observance save, perhaps, with a locomotive in particularly good running condition and a complete absence of checks. They have little to spare on the Cambridge main line passenger timings either, but over the latter line the increasing use of 1,750 Type 3s has now eased the position considerably.

In Table II there is set out a particularly good run on the 9.30 from Liverpool Street to Norwich, timed by D. C. Adams, with Type 4 No. D202 hauling a nine-coach train of 330 gross tons. The start was inauspicious, as a dead stand for signals at Bishopsgate resulted in Stratford being passed 2min late, but time recovery began immediately. Up the rising grades from Ilford to Harold Wood, averaging 1 in 400, speed rose to 70–73 m.p.h.; by Brentwood, after 2 miles up averaging 1 in 103, the rate had not fallen below 64; and on the final short 1 in 85 the minimum was 53 m.p.h. A "yellow" at the approach to Shenfield caused ½min delay, but with a clear road from there and no speeds higher than 81–83 m.p.h., Colchester was reached on time, actually in 49min 47sec for the 51.7 miles or 46¾min net. The short downgrade from Colchester is a help to down trains, and accounts for the very fast start to Manningtree—7.8 miles in 8min 33sec—and despite the check at Brantham, acceleration was so vigorous that up a mile at 1 in 145 followed by a level mile speed rose from 34 to 56 m.p.h., and further to 60 m.p.h. up the 2 miles at 1 in 157 to Belstead summit. So the 17.1 miles from Colchester to Ipswich were run in 19min 13sec or 17½min net.

From Ipswich to Norwich the time of 39min 35sec over the 46.25 miles was one of the fastest I have ever known, within 28sec of the historic effort of "Britannia" Pacific No. 70035 *Rudyard Kipling* with the same load some years ago. The times and speeds of the two runs in the early stages were almost identical, the diesel having the advantage of 15sec to Bramford, but the times were dead level at Haughley, the "Britannia" having attained 82 m.p.h. at Stowmarket as compared with the diesel's 77½ m.p.h. At the top of the 2 miles at 1 in 131 past Haughley the 4-6-2 also had the best of it, with a minimum speed of 70½ m.p.h. as compared with the diesel's 66 m.p.h.; the former also touched 94 as against the latter's 90 m.p.h. past Diss. By Trowse Upper Junction, *Rudyard Kipling* had covered 44.2 miles from the Ipswich start in 35min 19sec, whereas No. D202 had taken 35min 52sec. Both then made an unusually fast finish round the curves and over the swing-bridge into Norwich Thorpe. With net times of 46¾, 17½ and 39½min over the three stages, the diesel had achieved a net running time, for the 115.05 miles from Liverpool Street to Norwich, of 103¾min, which would make a net non-stop time of 100min possible without difficulty.

Class 7 steam bettered diesels at speed

Table III sets out a run of an up Norwich 2hr train, also timed by D. C. Adams, No. D209 having a load of 325 tons gross. The sharp curvature out of Norwich and the 1 in 84 climb to Trowse Upper Junction make a difficult start, in this case taking 4min 28sec for the 2.05 miles, but over the sharp undulations, mainly climbing, from Flordon to Tivetshall the diesel maintained 70 to 75 m.p.h.; speed was then restrained to a maximum of 82 m.p.h. at Diss. Here again we have a comparison with a "Britannia", for in 1958 No. 70039 *Sir Christopher Wren*, at the head of a 330-ton special train being run for the Crusaders' Union, though taking 5min 34sec up to Trowse Upper Junction, reached 81 as against 76 m.p.h. at Flordon, passed Forncett at 75 as compared with 70 m.p.h., and touched 90 at Diss compared with 82, so by Mellis having narrowed the gap between the two runs from 66sec to 8 sec; but then the Pacific ran into signal checks. Other runs have proved that a "Britannia" Pacific, though inferior in acceleration from rest, had a slight advantage over an English Electric Type 4 diesel in power output when fully extended at speed. The "Britannia" runs just quoted, however, were of a far more exceptional character than the diesel journeys now under review. Eventually, with the usual speed restrictions over Haughley curve and at the approach to Ipswich, No. D209 completed the run of 46.25 miles from Norwich in 42min 46sec, 2¼min inside schedule.

Onwards to London the diesel did not accelerate above 45 m.p.h. on the 1 in 120–130 climb to Belstead, and lost 1¼min to Colchester as the result of a check at Brantham; there was an acceleration, however, from 50 to 64½ m.p.h. up the 2½ miles at 1 in 134 from Manningtree to Ardleigh. Out of Colchester the start up to Marks Tey naturally fell a long way short of that of the Clacton electrics in Table I; as compared with the 7.8 h.p. per ton of train in the latter case, the 133-ton diesel with its 325-ton train mustered no more than 4.3 h.p. per ton. So the time over the 5.0 miles, start to pass, was 6min 47sec as compared with the electric 4½min or slightly less. Nevertheless, with 81 m.p.h. from Kelvedon to Witham, 75 minimum up the 1 in 178 to Hatfield Peverel, and 82 at New Hall, No. D209 was well inside "even time" by Chelmsford; then followed a minimum of 60 m.p.h. over Ingrave summit, and with a commendably clear road beyond, subject to the usual restrained speed past Gidea Park and from Ilford onwards, the 51.7 miles from Colchester to Liverpool Street were run in 49min 24sec, a gain on schedule of 3½min. On this up run, therefore, the net running times over the three stages, 42¾, 18 and 49¼min, added up to 110min.

Fast start from Liverpool Street

Incidentally, one of the fastest exits from Liverpool Street that I have known was timed by P. Ankers behind No. D202 with a train of 307 tons tare and 335 tons gross, with a time of

1 ER COLCHESTER–CHELMSFORD

10-coach electric multiple-unit sets; 3,384 h.p.; 434 tons tare, 455 tons gross

Run No.			1		2		3		4	
Dist.		Sched.	Actual	Speeds	Actual	Speeds	Actual	Speeds	Actual	Speeds
miles		min.	m. s.	m.p.h.	m. s.	m.p.h.	m. s.	m.p.h.	m. s.	m.p.h.
0.00	COLCHESTER ..	0	0 00	—	0 00	—	0 00	—	0 00	—
2.70	*Stanway*	—	2 57	82	2 46	77½	2 49	80	2 45	80
5.00	Marks Tey	4½	4 27	94/86	4 25	95/92	4 27	88/92	4 23	90/88
9.45	Kelvedon	—	7 25	96	7 16	92	7 24	94	7 13	99
11.95	*Milepost 39¾*	—	9 03	*80	8 55	*75	9 05	*80	8 51	*70
13.10	WITHAM	11½	10 29	—	10 27	—	10 43	—	10 29	—
2.70	Hatfield Peverel ..	—	3 22	71½	3 24	70	3 21	71½	3 23	70½
6.45	*New Hall*	—	5 54	92	6 00	93	5 51	94	5 59	92
8.85	CHELMSFORD ..	8½	8 08	—	8 21	—	8 07	—	8 12	—

* Speed reduction.

2 ER LIVERPOOL STREET–NORWICH

Locomotive: 1 Co-Co 1 Diesel No. D202 (2,000 h.p.).
Load: 9 coaches, 308 tons tare, 330 tons gross

Dist.		Sched.	Actual	Speeds
miles		min.	m. s.	m.p.h.
0.00	LIVERPOOL ST.	0	0 00	—
			sig. stop	*0
1.25	*Bethnal Green W. Jc.*	2½	5 19	—
4.00	STRATFORD ..	7	8 54	*51
7.35	Ilford	—	12 21	64½
10.00	Chadwell Heath ..	13	14 41	67½/73
14.95	Harold Wood ..	—	18 57	70
18.20	Brentwood ..	—	21 51	64
19.25	*Milepost 19¼* ..	—	23 04	53
			sigs.	*50
20.20	SHENFIELD ..	22½	24 31	—
23.65	Ingatestone ..	—	27 36	76/80
29.00	*Milepost 29* ..	(†1)	31 48	‡75
29.80	CHELMSFORD ..	31	32 30	*64
32.20	*New Hall* ..	—	34 39	75
35.95	Hatfield Peverel ..	—	37 38	76/74
38.65	WITHAM ..	39	39 42	82½
42.35	Kelvedon	—	42 21	83/76
46.70	Marks Tey ..	45	45 40	79
49.00	*Milepost 49* ..	—	47 26	81
51.70	COLCHESTER ..	50	49 47	—
2.35	*Parsons Heath* ..	—	3 43	45
4.35	Ardleigh	—	5 46	69
7.80	MANNINGTREE..	9½	8 33	78
			sigs.	*34
11.55	Bentley	—	13 21	56
13.30	*Milepost 65* ..	(†1)	15 17	60
16.35	*Halifax Junc.* ..	—	17 47	‡75
17.10	IPSWICH	20	19 13	—
2.45	*Bramford*	—	3 36	61
4 85	*Claydon*	—	5 52	70
8.40	Needham	—	8 51	75
11.95	STOWMARKET ..	—	11 38	77½
14.25	Haughley ..	14½	13 25	67½
16.70	*Milepost 85½* ..	—	15 41	66
17.90	Finningham ..	—	16 38	75
22.70	Mellis	—	20 15	81
25.30	DISS	—	22 44	90
27.80	Burston	—	24 28	83/74
30.90	Tivetshall	29	26 51	77
34.45	Forncett ..	—	29 27	84/90
37.00	Flordon	—	31 14	81
40.05	*Swainsthorpe* ..	(†2)	33 28	86
44.20	*Trowse Upper Jc.*	—	35 52	*43
45.35	*Swingbridge Jc.* ..	—	38 21	*
46.25	NORWICH ..	46	39 35	—

3 ER NORWICH–LIVERPOOL STREET

Locomotive: 1 Co-Co 1 Diesel No. D209 (2,000 h.p.).
Load: 9 coaches, 309 tons tare, 325 tons gross.

Dist.		Sched.	Actual	Speeds
miles		min.	m. s.	m.p.h.
0.00	NORWICH ..	0	0 00	—
2.05	*Trowse Upper Jcn.*	—	4 28	47
5.20	*Swainsthorpe* ..	—	8 01	58
8.25	Flordon	—	10 48	76
10.80	Forncett ..	—	12 58	70
14.35	Tivetshall	17½	15 52	75

Table 3 (continued)

17.45	Burston	—	18 08	81
19.95	DISS	—	19 58	82
23.55	Mellis	—	22 44	75/80
28.35	Finningham ..	—	26 27	75
32.00	Haughley ..	32	29 26	*64
34.30	STOWMARKET ..	—	31 33	71
37.85	Needham	—	34 22	81
41.40	Claydon	—	37 04	77
43.80	*Bramford*	—	38 55	74½
45.45	*East Suffolk Jc.* ...	—	40 33	*56
46.25	IPSWICH	45	42 46	—
3.80	*Milepost 65* ..	—	5 58	45½
5.55	Bentley	7½	7 52	73/77½
			sigs.	*48
9.30	MANNINGTREE..	10½	11 26	50
12.75	Ardleigh	—	15 28	64½/76
17.10	COLCHESTER ..	18½	19 41	—
2.70	*Stanway*	—	4 19	50
5.00	Marks Tey ..	7	6 47	64½
9.45	Kelvedon	—	10 28	81
13.10	WITHAM ..	13½	13 09	81
15.75	Hatfield Peverel ..	—	15 12	75
19.50	*New Hall* ..	—	18 00	82
21.90	CHELMSFORD ..	20½	19 54	*65
28.05	Ingatestone ..	—	25 18	67/69
31.50	SHENFIELD ..	29½	28 10	66
32.45	*Milepost 19¼* ..	—	29 07	60
33.50	Brentwood ..	(†1)	30 02	76
36.75	Harold Wood ..	—	32 35	*70/*64
41.70	Chadwell Heath ..	39	36 57	69
44.35	Ilford	(†1½)	39 22	*62/65
47.70	STRATFORD ..	46	42 44	50
51.70	LIVERPOOL ST.	53	49 24	—

4 ER LIVERPOOL STREET–PARKESTON QUAY

Locomotive: Co-Co Diesel No. D6711 (1,750 h.p.).
Load: 12 coaches, 420 tons tare, 450 tons gross.

Dist.		Sched.	Actual	Speeds
miles		min.	m. s.	m.p.h
0.00	LIVERPOOL ST. ..	0	0 00	—
2.95	*Bow Junction* ..	—	5 53	—
4.00	STRATFORD ..	7	7 15	*50
7.35	Ilford	—	10 54	57
10.00	Chadwell Heath ..	13	13 37	60
14.95	Harold Wood ..	—	18 43	57½
18.20	Brentwood ..	—	22 40	—
19.25	*Milepost 19¼* ..	—	24 28	32½
20.20	SHENFIELD ..	22½	25 43	—
23.65	Ingatestone ..	(†1)	28 53	75/79
29.80	CHELMSFORD ..	31	34 11	*57
32.20	*New Hall* ..	(†2)	36 28	—
38.65	WITHAM ..	41	42 11	76½
42.35	Kelvedon ..	(†1)	45 16	68
46.70	Marks Tey ..	48	49 03	70½
49.00	*Stanway*	(†2)	50 52	79
51.70	COLCHESTER ..	54	52 52	82
54.05	*Parsons Heath* ..	—	55 02	66
56.05	Ardleigh	(†2)	56 51	*60
59.50	MANNINGTREE..	64	60 31	*15
61.20	Mistley	(†2)	64 12	—
65.15	Wrabness ..	—	68 43	61
68.90	PARKESTON QUAY	80	74 00	—

5 WR TAUNTON–PADDINGTON

Locomotive: BB Diesel-hydraulic No. D862 *Viking* (2,200 h.p.).
Load: 11 coaches, 385 tons tare, 410 tons gross.

Dist.		Sched.	Actual	Speeds
miles		min.	m. s.	m.p.h.
0.00	TAUNTON ...	0	0 00	—
4.75	*Cogload*	—	6 12	67
8.00	*Athelney*	—	8 56	72
11.95	*Curry Rivel Jc.* ...	—	12 00	80½
17.20	*Somerton*	—	16 10	72/77½
22.70	*Keinton Mandeville*	—	20 58	70½/80½
27.60	Castle Cary ...	24	24 50	*60
31.05	Bruton	—	28 30	64
34.50	*Brewham*	—	32 25	50
36.35	Witham	—	34 10	71½
40.45	*Blatchbridge Jc.* ...	35½	37 25	79
42.50	*Clink Road Jc.* ...	37½	39 07	70½/76½
45.75	*Fairwood Jc.* ...	40½	42 11	*33
47.20	WESTBURY ...	43	46 07	—
1.00	*Heywood Road Jc.*	—	2 32	—
8.65	Lavington ...	12½	9 46	76½
14.45	Patney	17½	14 55	64½
16.65	Woodborough ...	—	16 51	72
20.20	Pewsey	—	19 43	77½
25.45	SAVERNAKE ...	26½	24 23	*54
29.15	Bedwyn	30	27 54	69
34.00	Hungerford ...	—	32 25	*54
37.05	Kintbury	(†3)	36 13	76½
41.35	*Enborne Jc.* ...	—	38 39	—
42.45	NEWBURY ...	44	42 21	—
3.55	Thatcham ...	—	5 40	69
6.35	Midgham	—	8 11	70½
8.30	Aldermaston ...	(†4½)	9 49	75
11.80	Theale	—	12 40	76½
15.25	*Southcote Jc.* ...	—	16 05	*40
16.20	Reading West ...	—	17 40	—
17.10	READING ...	23	22 00	—
5.00	Twyford	(†5)	6 25	71½
11.75	Maidenhead ...	—	11 37	82
17.55	SLOUGH	20½	15 51	83½
22.75	West Drayton ...	(†1½)	19 43	82
26.90	Southall	29	22 50	82
30.30	Ealing Broadway ...	(†4)	25 28	75
33.25	*Old Oak Common*	—	29 04	—
34.75	Westbourne Park	39	32 05	—
36.00	PADDINGTON ...	44	37 49	—

6 WR BATH–PADDINGTON

Locomotive: Co-Co Diesel-electric No. D1696 (2,750 h.p.).
Load: 12 coaches, 418 tons tare, 440 tons gross.

Dist.		Sched.	Actual	Speeds
miles		min.	m. s.	m.p.h.
0.00	BATH	0	0 00	—
5.00	Box	—	6 00	75
8.55	Corsham	—	9 01	66
12.90	CHIPPENHAM ..	13	12 29	90
19.10	Dauntsey ..	—	16 37	90
23.95	Wootton Bassett	22	20 11	81
29.55	SWINDON ..	26½	24 00	87
35.35	Shrivenham ..	—	27 58	88
40.35	Uffington	37	31 21	89
46.45	Wantage Road ..	—	35 28	89
50.35	Steventon ..	43½	38 04	89
53.75	DIDCOT	46	40 25	89
58.40	Cholsey	—	43 37	87
62.10	Goring	—	46 12	86
65.30	Pangbourne ..	—	48 28	*80
68.20	Tilehurst	—	50 35	85
70.85	READING ..	61½	52 37	*77
75.85	Twyford	65½	56 31	*75
			p.w.s.	*15
82.60	Maidenhead ..	72½	65 25	73
88.40	SLOUGH	78½	69 45	90
93.60	West Drayton ..	—	73 20	90
97.75	Southall	87½	76 05	86
101.15	Ealing Broadway ..	—	78 25	*80
105.60	Westbourne Park	97	82 30	—
106.85	PADDINGTON ..	102	86 00	—

* Speed restriction. † Recovery time (min.). ‡ Before shutting off power.

29min 27sec to a dead stand for Chelmsford home signal, at just beyond the 29½ milepost, 29.6 miles in 29min 27sec. After passing Stratford in a very fast 6min 25sec, the diesel was doing 73–75 m.p.h. all the way from Seven Kings to Harold Wood, fell to 53 m.p.h. at Ingrave summit and touched 86 m.p.h. beyond Ingatestone. Ilford was passed in 9min 42sec, Chadwell Heath in 12min dead, Brentwood in 19min 8sec, Shenfield in 21min 17sec, and Ingatestone in 24min 2sec. After 30sec standing at the platform end, No. D202 stopped at Chelmsford station in 30min 34sec from London.

With the Type 3 diesels of 1,750 h.p. my experience has mainly been on the "Hook Continental". My last run on this train is set out in Table IV, with No. D6711 and the usual 12-coach load of 420 tons tare; with practically every seat occupied the gross load was some 450 tons. The point-to-point timing of this train is rather curious. With such a load it is

practically impossible for a Type 3 diesel to get through Shenfield in 22½min; in this case, with no higher speed than 60 m.p.h. before Harold Wood and a minimum of 32½ up Brentwood bank we took 25min 43sec, a loss of 3¼min. But with the profusion of recovery times from there onwards, it was an easy matter to turn the 3¼min arrears into an arrival at Parkeston Quay 6min early, in 74min exactly from London; 7min was cut from schedule between Marks Tey and Parkeston alone. To me the thrill was to dash through Colchester at 82 m.p.h., after many past years of the 40 m.p.h. restriction here. It will be noted that if all the recovery times be deducted, the net allowance of the "Hook Continental" from Liverpool Street to Parkeston Quay is no more than 70min for the 68.9 miles and though a Type 4 2,000 h.p. diesel might manage this time with a train of 420 tare tons, I very much doubt if a Type 3 of 1,750 tons could ever do so. And when, as is planned, Pullman cars eventually replace the first-class accommodation, haulage of this express will become a tougher task still.

Diesel handling is variable

Comment has sometimes been made that even diesel motive power, which might appear at first sight to be completely predictable, can show variations in performance almost as great as those to which we were accustomed in former years with steam power. The steam locomotive was at the mercy of the quality of coal with which it was supplied and the competence or the reverse of its fireman, apart from the fact that the performance characteristics of two units of the same type might, for one reason or another, differ considerably. This last applies also to diesel power, though not, perhaps, to quite so great a degree. But notwithstanding the simplicity of handling a diesel, as compared with the brains needed for getting the most out of a steam locomotive, by suitable manipulation of cut-off percentage and regulator opening, the human element can still be responsible for no small variation in diesel performance also. Of this recently I had striking evidence on a recent run over the Western Region from Taunton to Paddington.

The train was the 11.50 from Penzance and from the telegraph board at Taunton it became clear that time was being dropped. Eventually the train drew into Taunton about 13min late, 11 coaches weighing 385 tons tare and 410 tons gross, headed, not by a "Western" C-C type diesel of 2,700 h.p., but by a B-B "Warship" of 2,200 h.p., No. D862 *Viking*. In the circumstances I was not anticipating anything outstanding in lost time recovery, but soon after starting we were doing well; indeed, even by Curry Rivel Junction we were up to 80 m.p.h. on but little easier than level track and had achieved "even time" in only just over 12 miles; a minimum of 72 m.p.h. up 4½ miles at 1 in 264 to the east end of Somerton tunnel also was excellent. Then down into the dip beyond Somerton, rather curiously, there was little acceleration; yet on the slight fall after Keinton Mandeville once again we had attained 80 m.p.h. The prescribed 60 m.p.h. past Castle Cary was duly observed and the long climb to Brewham was attacked with vigour, speed not falling below 50 m.p.h. even up the final 1 in 98–81. So by Fairwood Junction we had run 45.75 miles from Taunton, start to pass, in 42min 11sec. And then? Instead of the permitted 40 m.p.h. over the junction, a slowing to 33 and little or no power put on over the 1.45 miles on to Westbury, which took all but 4min. At least 1½min were thus thrown away.

Time is needlessly lost

From Westbury start once again *Viking* showed his paces, reaching 76 m.p.h. before beginning the 6 miles at 1 in 222 past Lavington, which were surmounted at a minimum of 64½ m.p.h. Speed up the gradual rise from Patney onwards was also excellent, as high a rate as 77½ m.p.h. being attained at Pewsey. But then once again there followed the unhappy time-dropping—54 m.p.h. at both Savernake and Hungerford instead of the permitted 60 m.p.h., and another crawling finish, over the 1.10 miles from Enborne Junction to Newbury stop in 3min 42sec, which meant a needless loss of another 1½min. Yet again, after reaching 76½ m.p.h. on the level at Theale and slowing as directed to 40 m.p.h. over Southcote Junction, 5min 55sec were spent over the ensuing 1.85 miles between there and the Reading stop. This is the one point at which I did not verify what the signal indications were, and to give the driver the benefit of the doubt, a signal check may have accounted for some of this loss.

On the final stage yet once again *Viking* put up an admirable performance with this 410-ton load, maintaining 82–83½ m.p.h. on level track for over 20 miles until power was shut off at Ealing. But after what had happened already, I was prepared for how the run would probably end, and I was right. Though all signals were off, the average speed dropped to 43.5 m.p.h. from Acton to Old Oak Common new box, 30.0 m.p.h. from Old Oak to Westbourne Park, and 13.1 m.p.h. from Westbourne Park until we had finally crawled to a dead stand at Paddington. The last 4.25 miles had thus taken 10min 49sec, the last 2.75 miles 8min 45sec and the last 1.25 miles 5min 44sec. So, after passing Ealing Broadway, 30.3 miles from Reading, in the fine time of 25min 28sec, it took 37min 49sec to complete the 36.0 miles to Paddington. It may be granted that with lavish recovery times this stretch is allowed an unnecessarily easy 44min, but the point is that the train had left Taunton 14½min late, Westbury 16min late, Newbury 13min late and Reading 14min late. Even though on arrival this lateness had been reduced to 7½min, with rational running and no more exertion of the locomotive, aided by a complete absence of checks (apart from the possible one at the approach to Reading), we might easily have been in on time.

In complete contrast to the foregoing, I conclude in Table VI with a run on the "Bristolian" from Bath to Paddington, timed by R. D. Spiers, which also had a late start of 15½min, due to a points failure at Keynsham, but which had a very different ending. The substantial 12-coach load of 418 tons tare and 440 tons gross was headed, not by a "Western" diesel, but by one of the 2,750 h.p. Brush-Sulzer Co-Cos, which have been winning golden opinions everywhere. Once again the operating authorities were able to give the driver a completely clear road and apart from a 15 m.p.h. permanent way relaying check between Twyford and Maidenhead he made everything possible of his opportunity.

88 miles at 80 m.p.h. average

The 1 in 100 through Box tunnel dropped the speed from 75 to 67 m.p.h., but the 2 miles at 1 in 100 up Dauntsey bank had no more effect than to reduce the rate from 90 to 81 m.p.h. From Swindon it was 86–89 m.p.h. without a break to Goring; then followed the prescribed easings round the Pangbourne and Twyford curves and through Reading, and, after the permanent way slowing, 90–86 m.p.h. again from Slough to Southall. So, with a normal run in—7min 35sec from Ealing as compared with *Viking's* 12min 21sec—the "Bristolian" came to a stand on time, having recovered 16min in all. Over the 88.25 miles from Chippenham an average speed of 80.2 m.p.h. had been maintained, and over the 52.4 miles from Chippenham to Pangbourne 87.3 m.p.h. One moral to be drawn from this run is that there can be little justification in continuing to allow the "Bristolian" 119min from Bristol to London as compared with the 105min—even if then non-stop—booking introduced no less than 30 years ago.

A reader has taken me severely to task for having commented adversely in my November article on the terminal working at King's Cross, after having been stopped on the "Flying Scotsman" at Belle Isle and arriving 2½min late because an empty stock train was allowed across our path. Unhappily this is no isolated case. A week or so later I was travelling up on the "Tees-Tyne Pullman", the driver of which, leaving Newcastle 19min late because of steam-heating trouble, not merely picked up this delay, but 16min of permanent way and signal checks as well, and passed Finsbury Park 2min *early*, yet only to have another exasperating stop at Belle Isle and so to arrive 4min late. Out of my last 14 recorded runs into King's Cross, on six of them we have been stopped in this way, and on only two when the train concerned was running ahead of time; on most others we have been checked, and on eight runs only have we arrived on time or early. These facts, I think, speak for themselves.

[The author gratefully acknowledges the receipt, up to December 1, of letters from Messrs. D. C. Adams, J. M. D. Bateman, T. N. Bond, Paul Bundle (2), A. Crane, David Dixon, H. G. Ellison, H. J. J. Griffith, David R. Jack, H. F Maybank, C. M. Napper (2), I. D. M. Reid, R. L. Sewell, Colin Starkey, R. Townsin, John G. Webber, Robin H. White and P. M. Widgery.]

British Rail

the new image

FROM Dr. R. BEECHING, CHAIRMAN OF THE BRB

TO a great extent the future of British Railways depends on what the travelling public and industry think of us. This public image is largely determined by what passengers and industrial users see of British Railways.

Our aim, a truly modern railway shaped to existing and future needs, cannot be achieved overnight. It is being developed phase by phase as fast as possible. But, meanwhile, much remains of the system which is drab, inefficient and out of keeping with the times.

The railways' corporate identity programme is the visible expression of the great managerial effort which has been introduced into the railways in recent times. It is intended to emphasise visually our progress towards a unified, efficient and viable railway system.

R. Beeching

BRITISH Railways have embarked upon the most comprehensive and thorough overhaul of their visual image ever attempted in the long history of this country's railways. The new Corporate Identity Programme—to use the official term—is based upon the sound belief that, properly planned and applied, good visual design can act as a powerful selling agent, but one that can be created by comparatively modest expenditure.

For some time, many people inside and outside the industry have felt that BR's public image—or reputation—was lagging behind the technical promise of new locomotives, better carriages, modern signalling etc., and the behind-the-scenes reorganisation of administration and control. Constant efforts to improve have still not fully registered on the public mind. Much remains that is visually out-dated or dull and this tends to be emphasised when it becomes the background to bright new equipment. For example, the diesel Pullmans begin and end some of their journeys at stations with amenities far below the standards of the trains themselves. Of course, a great deal is being done to remedy these obvious deficiencies. But it has become increasingly apparent that a much more comprehensive and fundamental "new look" is needed, if the public—rail users or otherwise—are to be made fully aware of the many striking improvements in course of development.

To be effective, this "new look" must transform every activity of the railway system. Every visual feature must be considered: passenger trains; stations; freight services; town offices and other architecture; signposting; all types of uniforms, dress and accessories; ships; road vehicles; printed matter of all kinds; and every branch of publicity. In fact, there has got to be one of the biggest industrial facelifts the country has seen, in which nothing representative of BR will escape the designer's net.

The basic visual elements which can be used to create an effective corporate image, or identity, consist of a symbol, a logotype (or name style) and house colours. These used in conjunction, or separately, must be immediately recognisable and must become indelibly associated with the undertaking. Well-known examples of firmly-established corporate identities are those of Shell, BEA and London Transport. Compared to these, the visual impact of BR hitherto has been a confused collection of symbols, names and colours, with semi-traditional, semi-Regional influences. To take one aspect, colours for BR rolling stock were chosen without any consideration for an overall house colour scheme—which, in turn, did not really exist, except on the Southern Region, where the wholesale use of green achieved a degree of purely Regional identity. The five other Regions were all given maroon passenger rolling stock (although the WR dissented for a brief period), despite the long-standing association of that colour with the LMR and its forerunner, the LMS. Thus neither a national nor a Regional house colour scheme could evolve satisfactorily; moreover, any potential publicity value of the six Regional colours was lost.

Likewise, neither the first nor the second attempt to produce a BR emblem resulted in a design either striking enough or adaptable enough for its purpose. The additional use of a third—and meaningless—emblem, the "sausage", for station signs and publicity only confused the situation, which was worse confounded by the variety of name styles, from "British Railways" to Regional titles and then those of individual lines or divisions, which have been used. All these many and inconsistent visual manifestations have muddled the image of

an undertaking which in every other department of its business has been trying to present the appearance of a unified, efficient concern.

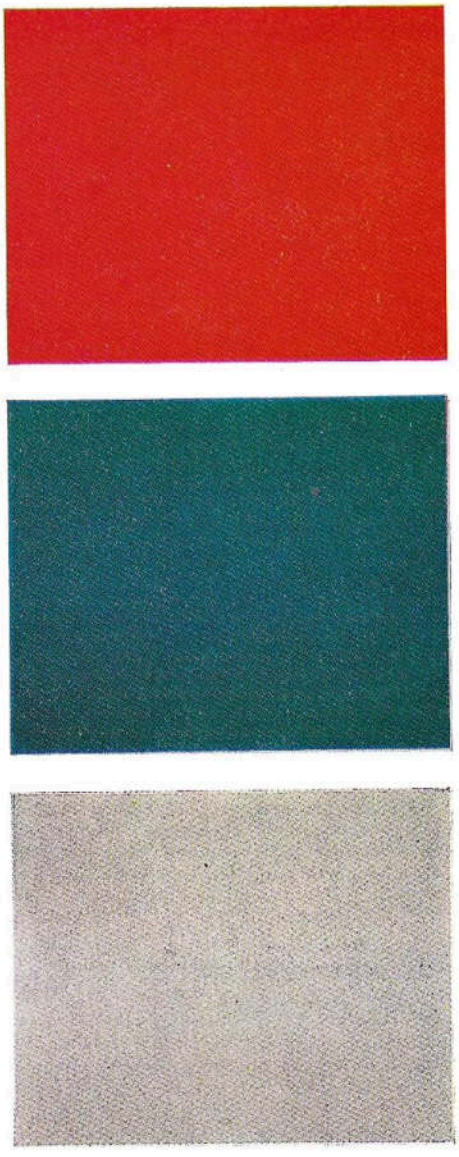
Before nationalisation each of the "Big Four" had a clearly distinguishable identity, emphasised by long-standing differences in the design of locomotives, rolling stock and livery schemes. To retain these loyalties and distinctions in face of increasing standardisation and the creation of a unified national network—in which Regional boundaries have altered several times—is quite impracticable. Logic demands a clean break with the past on this score alone, quite apart from the imperative need to reflect modification of physical assets.

A corporate identity, therefore, is the visual expression of unified management. It requires standardisation throughout the organisation of a single code of visual practice that will fittingly characterise the services it offers. After an extensive investigation by a working party set up by the BRB Design Panel and including the Board's consultants and its Design, Architect's, Commercial and Publicity departments, a new BR corporate identity programme was recently drafted and submitted to the BRB. The Board has now approved it, subject to certain reservations where they consider further research and development is desirable. Its application will go ahead under the guidance of a Corporate Identity Steering Committee, chaired by the BRB Director of Industrial Design, Mr. George Williams.

The new symbol

The symbol is based upon the idea of two-way traffic movement. It can also be interpreted as rail tracks, and the arrows combine to produce an electrification flash. With an easily recognisable, forceful and simple outline it can be reproduced in a wide range of materials and sizes without losing its impact. Thus it meets the most important requirements of a good symbol. It can be painted, stencilled, printed, cast in metal, formed in plastics, shaped in wood, or engraved on surfaces with equal success. Whether in relief or flat, it retains its form. Initially it has been approved to replace the BR "sausage" on all advertising and promotional material, station facades, and certain other applications including ship funnels and house flags. It is not yet finally approved for application to rolling stock.

For general public usage the abbreviation "British Rail" will be adopted. This is considered more forceful, simple to read and comprehend. Moreover, it is more easily accommodated in a variety of settings than the full style "British Railways". As a logotype (or mark), "British Rail" has been

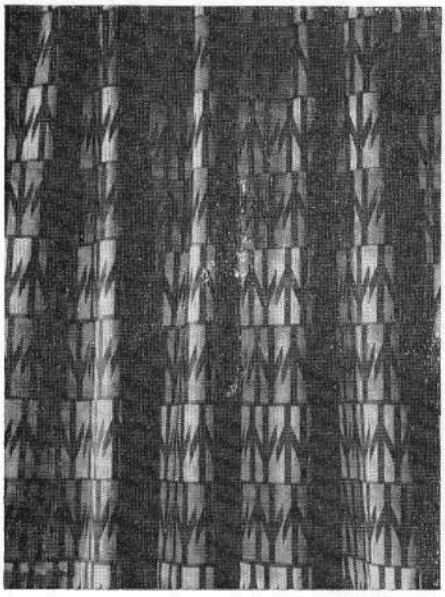


HOUSE COLOURS: Three distinctive colours—monastral (or rail) blue, flame red and pearl grey—have been adopted as the new BR house colours.

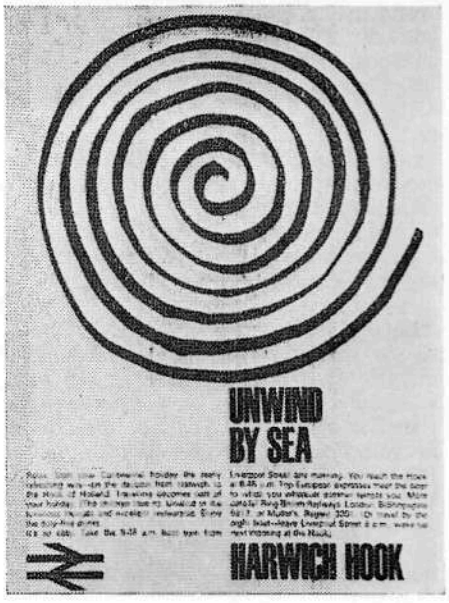
SHIPS: The new BR ship livery, shown in a Sam Lambert photo of a model of the *Duke of Rothesay*. A number of ships have already been repainted.

Text by Brian Haresnape

Photos by British Railways



THE NEW SYMBOL: Easily adapted to use in many sizes and materials, the new symbol is distinctive whether used as a basis for textile design, as shown on the curtain, or applied to advertising matter.



PRINTED PUBLICITY: The new symbol and logotype are here used as a straightforward "mark" on two newspaper advertisements for BR shipping routes. Publicity will make the most immediate public impact of the new programme. By use of the new elements in this way, a quick effect can be achieved at no extra cost. The symbol replaces the BR "sausage" for all advertising material, also on station facades and nameboards.

carefully drawn, weighted and spaced to provide the ideal balance for the words, and to be in character with the new symbol.

A standard alphabet

A full sans-serif alphabet, in line with modern typographic design, has been prepared for general application. In addition, specifications have been drawn up for the use of type-faces of the same family for printed matter.

Approval has so far been granted for use of the name style, logotype and alphabet on advertising and promotional material and stations.

House colours and livery

The new house colours are monastral (or rail) blue, pearl grey and flame red. The colours reflect—but with their own subtle distinctions of shade—the British national colours. The blue (a slightly greenish shade) and pearl grey are to be generally applied, but the flame red will be restricted to smaller areas and used to emphasise the new symbol. A standard livery for passenger rolling stock and all locomotives, based on the new house colours, is considered desirable because this is the most conspicuous means to familiarise the public with the new identity. However, experiments are still in progress to assess the durability and practicability of the new colours before making a final decision. The possibility of using one or more of the existing livery colours as the new house colours was examined, but none were considered to have all the required characteristics or adaptability. Approval has so far been given for use of the house colours on all print and publicity material, on nameboards for selected stations in each Region, for ships and on certain passenger trains. Regional colours will be systematically abandoned.

A design manual

The success of the programme will depend to a large extent on the way it is integrated with every element of railway operation. Haphazard and ill-planned application would only result in wasted effort and money. To ensure that not only the policy, but also the ways to apply its detail are fully understood a design manual is in production. This will be the detailed "book of rules" for all those who have the job of executing the corporate identity programme in the Regions.

Publicity will be transformed first

Broadly speaking there are five main fields of application for the corporate identity. These are: publicity (press advertising, sales promotion literature, posters and notices); architecture (station nameboards and signs, offices and travel agencies); locomotives and rolling stock; ships; and road vehicles. In addition, there are small items involved, such as glassware, cutlery, menu cards, crockery, book matches, carpets, curtains, plastic surfaces and moquettes. Obviously the speed with which the new styles can be introduced is dependent upon the scale of the job and the costs involved. The item to which it can be applied most quickly and cheaply is printed matter, and this was begun from December 27. Before long, the new symbol, logotype and house colours will be in standard, nationwide use on all BR publicity.

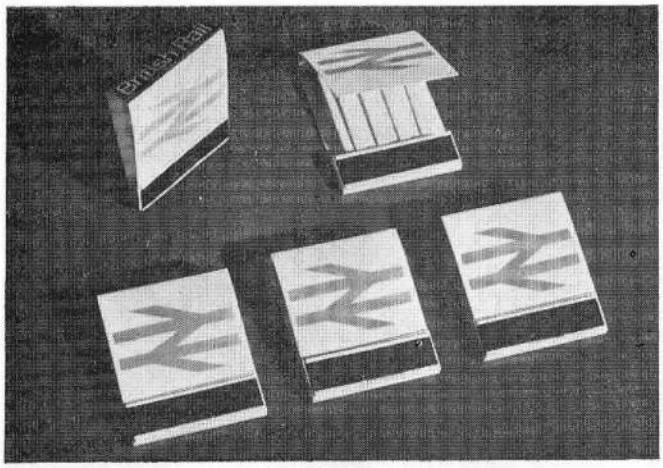
The new rolling stock livery

Good colour is probably the most important factor in creating an improved image. The dull maroon and varying shades of green now employed scarcely symbolise a bright, forward-looking concern and they compare unfavourably with the colour schemes of many of the railways' strongest competitors. A new colour scheme for passenger trains and locomotives is needed that is clearly expressive of modernity. However, the choice of a new livery is not based purely on aesthetics.

There are good reasons for painting freight stock in a livery quite different from that used on passenger stock. It is operationally desirable also to distinguish special equipment, such as Post Office vans and insulated containers. But as it is passenger train livery which makes the most impact on the public, the selection of this must be the primary concern; other liveries will then be derived from it or designed to harmonise with it.

Experience both in Britain and on the Continent shows that when passenger train colour schemes are diversified, either in the interests of Regional identity or to give emphasis to special trains such as TEE and Pullmans, a livery of unique

continued on page 32

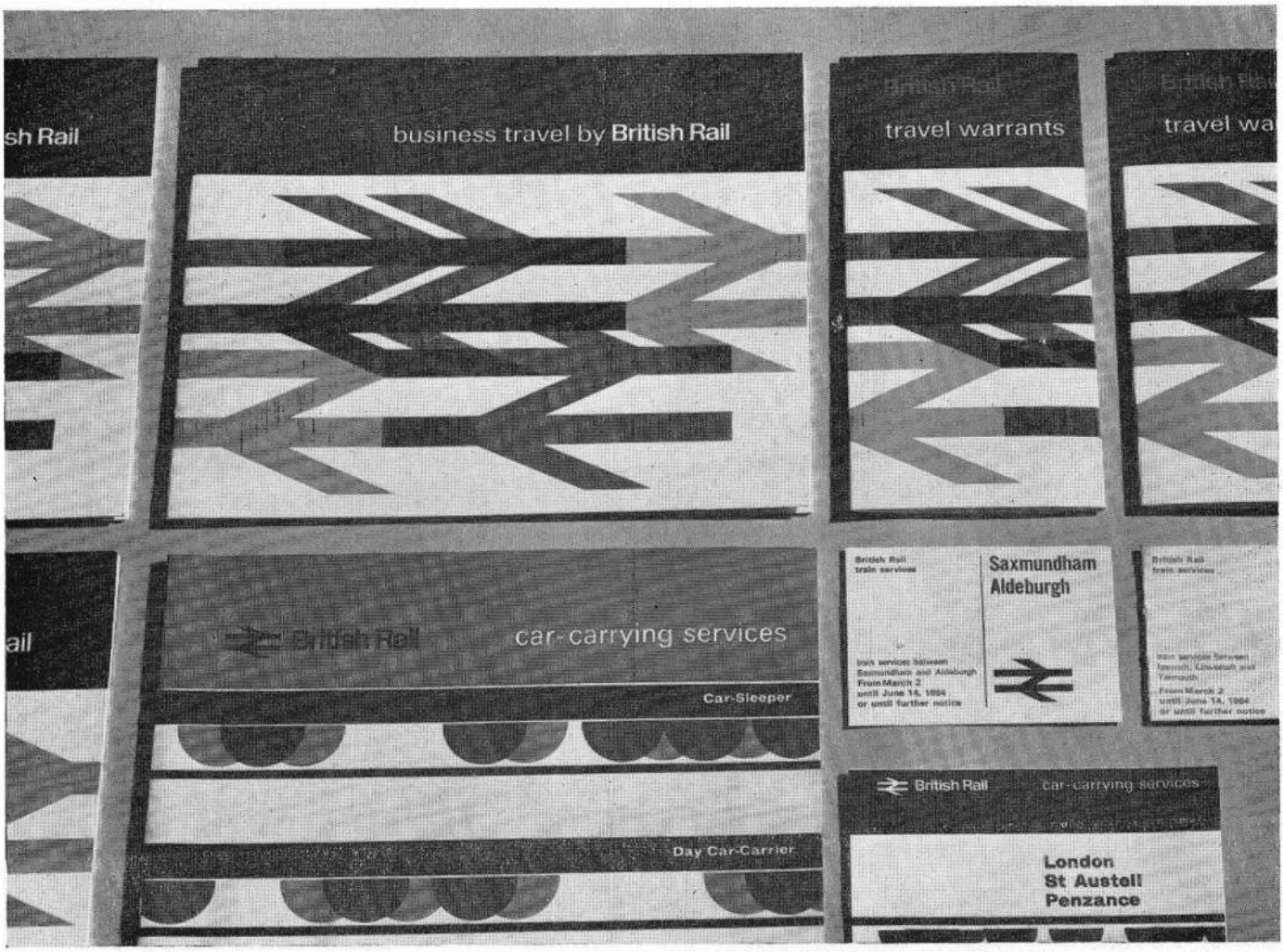


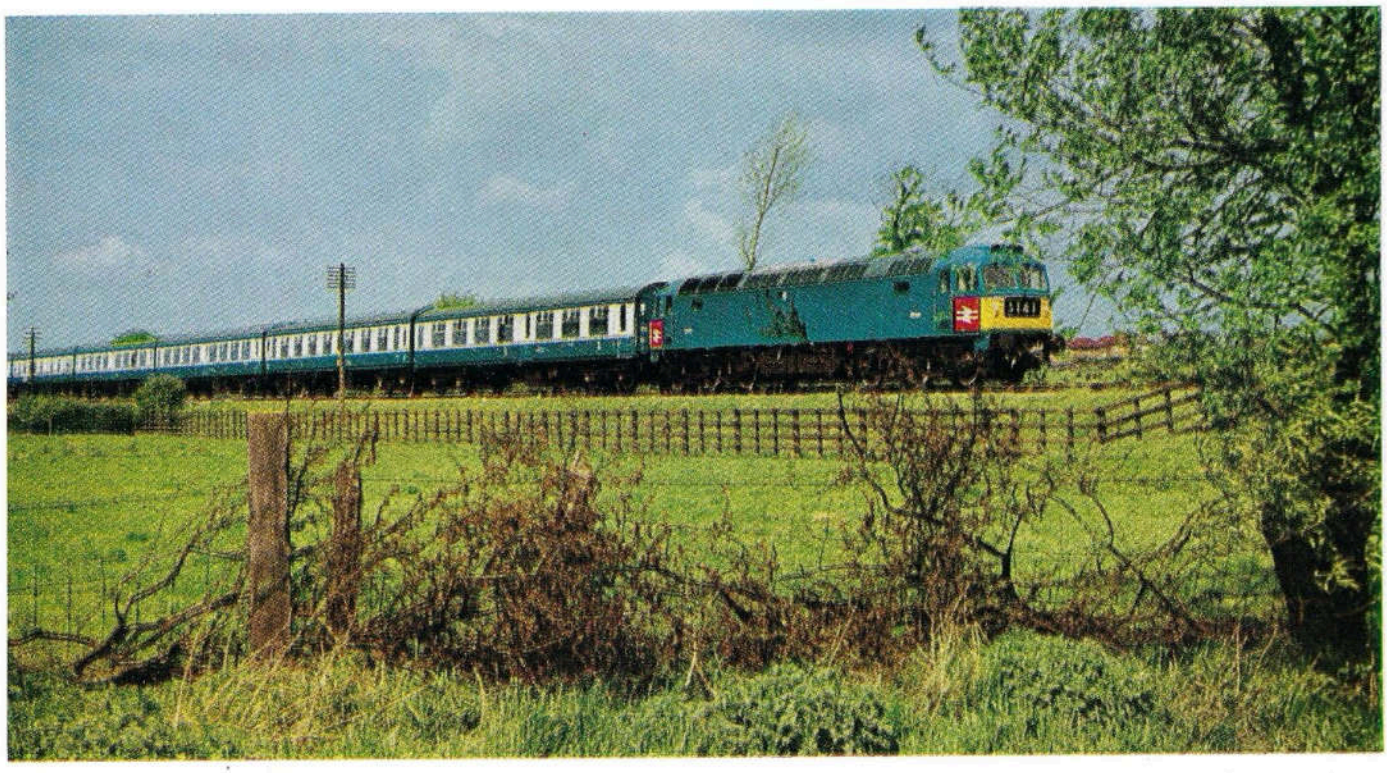
SMALL DETAILS: The thoroughness of the programme is exemplified by its attention to small details, such as book matches. This form of promotion has long been typical of BR's publicity-conscious competitors.

TRAVEL AGENTS: In many cases the potential passenger's first contact with BR is the local travel agent, in town or city shopping centre. Re-design of brochures, window displays and posters will help to sell a new image of rail travel to the man in the street.

publicity

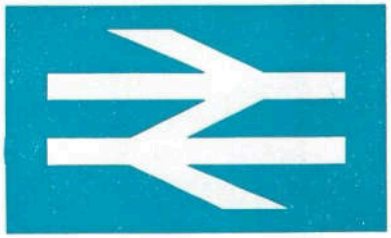
PRINTED MATTER: Already noticeable improvements have been made in the quality and originality of a great deal of BR promotion material for passenger services. The examples below demonstrate how the symbol and logotype can link a variety of printed matter with British Railways in the public mind. This is particularly important wherever BR publicity will be seen alongside competitors' propaganda. The symbol can be adapted to a wide range of eye-catching designs, like the cover of the brochures for business travel, shown below, where it is repeated to produce a formalised pattern reminiscent of railway track layout diagrams.

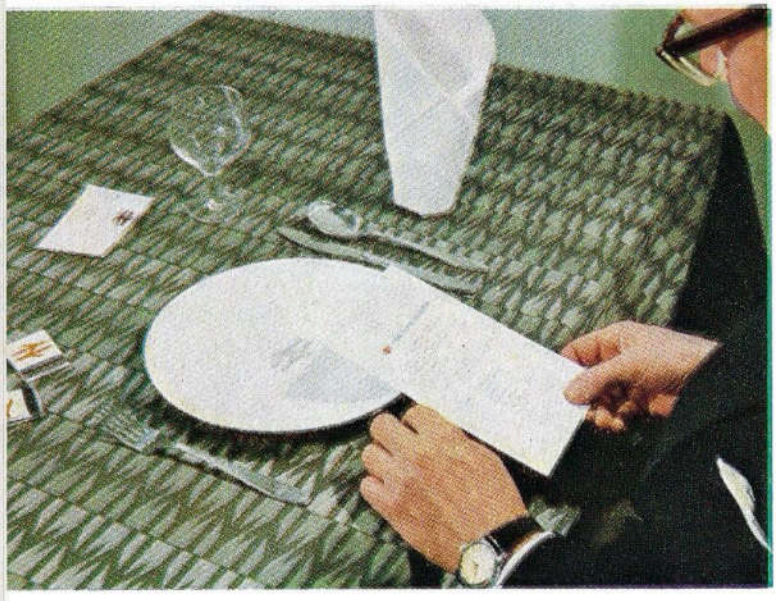




ROLLING STOCK: The first experimental application of the corporate identity elements was to the XP64 train (above), but the effect was soon spoilt by substitution of a green "Deltic" for the blue-liveried Brush Type 4 diesel. Early reactions to XP64 suggested the need for a slightly darker shade of blue, also that the red panels and symbol on the locomotive were too large and tended to conflict with the yellow warning panels. No firm decision on rolling stock liveries has yet been taken; experiments to determine the most satisfactory scheme are still in progress, and authority to paint 50 four-car LMR 25KV suburban multiple-units now under construction has been granted.

NOTICES, TABLEWARE, CARPETS: Possible applications for the new identity are far-ranging and colourful. Only by thoroughgoing use of the new style will a real impact be made; compromise will end in a confused image—half modern, half traditional.



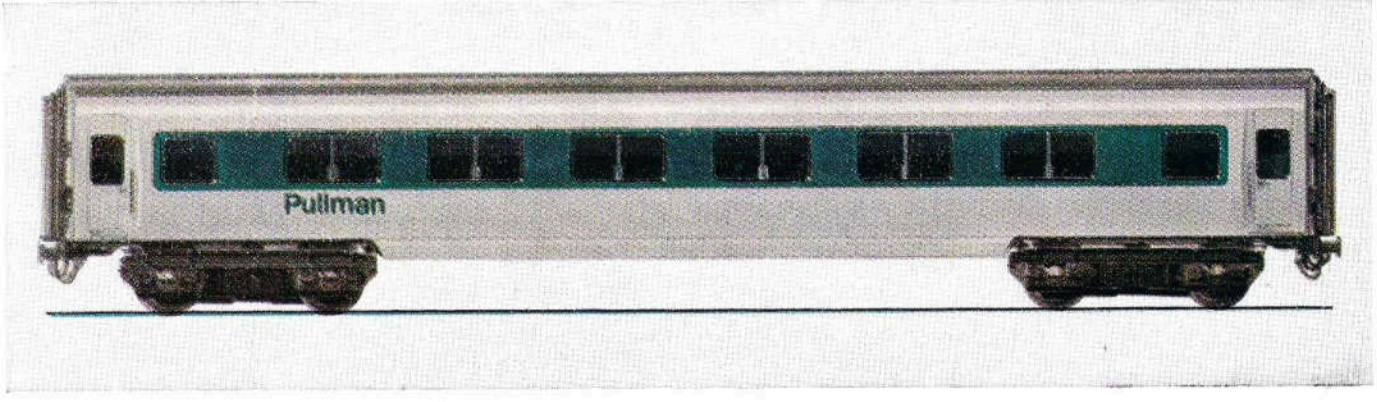


SYMBOL AND LOGOTYPE: This will normally be reproduced in blue for publicity purposes. According to application and suitability the shade of blue can be varied without losing effect, but flame red will be adhered to more strictly.

LINER TRAINS: Liner trains will benefit by starting from scratch with the new scheme. In this impression of a Liner train container mounted on a road trailer, the grey livery, with flame red band, hints at the powerful visual effect of a complete train. Provision has been made in the livery for traders to place their own trademark in the upper-right hand corner of the container sides.

British Rail a corporate identity

PULLMAN LIVERY: Pullmans are included in the overall corporate identity scheme. Two Pullman liveries are in current use—umber and cream, and the diesel blue and white. Suggested is a standard scheme that reverses the conventional disposition of the colour masses, with a broad blue band along the bodyside at window level, and pearl grey as the predominant colour. This scheme is similar to recent practice on the Canadian National and Japanese National Railways. However, as already observed, the final version of the standard rolling stock livery has yet to be decided.



characteristics will attract so much attention that it depresses excessively the status of the rest of the system's rolling stock. To avoid this ill-effect, a railway needs one clearly recognisable, integrating livery without any variations for specific Regions, services or types of passenger vehicle. Locomotives should also be in the same basic colour, relying mainly on their different form and the disposition of windows and louvres to distinguish one type from another.

The pristine appearance of new paintwork is no criterion by which to judge a colour scheme for rolling stock. The choice of colours must make allowances for the outcome in service of dirt, abrasions and a gradual loss of brightness, also the effects of ordinary urban atmospheres and lighting, which filter out much of the colour, decreasing its strength and purity. Thus a successful new livery must be vigorous, so that it will always look as nearly fresh and clean as possible; it must use paints which are intrinsically fresh and full of colour, rather than browns or greys. The SR green probably fulfils these requirements better than any of the other colours at present in use on BR, but it tends to be too institutional in its associations. The new monastral blue fulfils these requirements very satisfactorily and has the advantage of being a colour not so rigidly traditional to railway usage (except for Gresley's garter blue pre-war streamliners on the LNER.) However, only prolonged trials in service can really demonstrate its effectiveness and durability for rolling stock. The first experimental application was made last May to the Derby-built XP64 train and to Brush/Sulzer Type 4 No. D1733. Following this initial experiment a slightly darker shade of the blue was considered desirable. The BRB has now authorised the painting of 200 carriages of LMR 25kV suburban electric m.u. stock, presently under construction, in this darker blue livery. Only main-line stock would have the pearl-grey window areas; suburban stock is envisaged as plain blue. No final decisions will be made until these trials have demonstrated the full effects of time and wear on the new colour scheme.

Pullman stock will employ the same basic colours as other stock, but a case can be made for a special arrangement of them in this instance. One proposal (*illustrated on page* 31) visualises pearl grey as the predominant bodyside colour, with a wide band of the blue at window level. Freight vehicles will remain as at present—bauxite red and ice blue, with yellow for road vehicles. These are considered to harmonise well with the new house colours. New types of service, such as company trains and Liner trains, will have liveries in harmony with the overall scheme.

New ship livery is welcomed

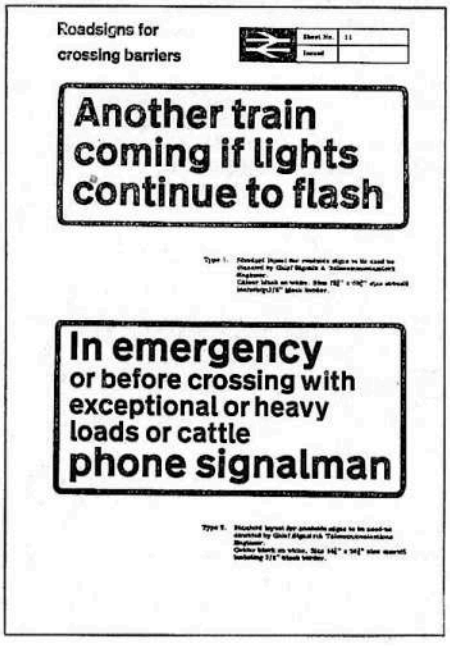
The repainting of BR ships in the new colours is already well under way. By the time this article is in print some 20 vessels of the fleet are expected to be in the new colours. Initial reactions approve the colours and symbol as exemplifying the best of modern marine practice. Certainly the visual transformation, from drab black to rich blue for the hull and from buff yellow to flame red for the funnel, is a striking one. The superstructure is decked out in a light blue-grey. The symbol is painted in white on the flame red funnel, and is featured on the house flag. Lifeboats are painted white.

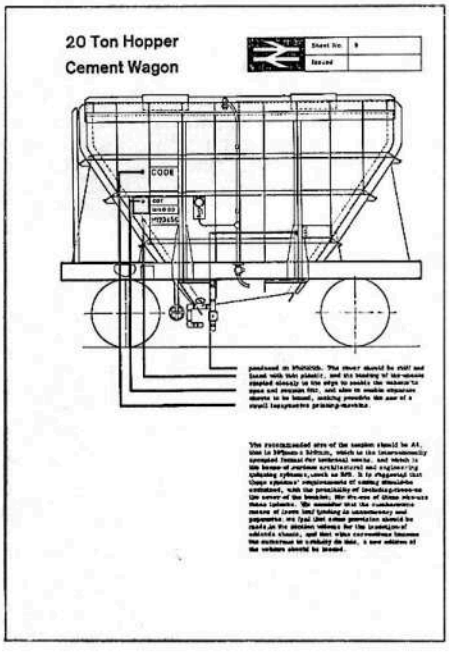
Architectural decor

Uniformity of colour in decor and fixed equipment will be avoided. Following recently established practice, paint colours for stations will still be chosen to harmonise with the colours of unpainted surfaces (e.g. brick, stone, tiles, etc.) and with the character of the surroundings (rural, urban, industrial). But the corporate identity of BR can be established without delay in stations of all sizes throughout the system—despite variety of decor—by uniform treatment of station nameboards, signs and advertisements. Colour and lettering on all directional signs can conform to the new standards and the symbol and logotype be used wherever appropriate. Regional colours for station signs will gradually be replaced as a result of this scheme. In addition, pictograms will be used in place of signboards for parts of the station in general use, such as lavatories and telephones. This is in keeping with the practice of many Continental systems and of airports. Use of the new standard alphabet and house colours, plus the pictograms, will assist the travelling public, who expect the same clarity and legibility on all stations, regardless of their Regional ownership. An essential part of the new programme is the use of the symbol and logotype on station facades—the front door to rail travel.

A difficult problem is the conflict between commercial advertising and directional signs, especially on the larger stations with concourses, or crowded platform areas. Ideally,

MANUAL OF DESIGN: A comprehensive manual of design is in preparation. This will act as a mandatory guide to all those responsible for implementing the corporate identity programme, both BR staff and outside contractors. It will lay down standards for every aspect of the programme and will be produced so that it can be added to as required, to cover new developments. Illustrated are three specimen pages showing how the various elements of the identity will be handled: standards for roadsigns at automatic barriers; lettering on a wagon; and porters' uniforms.





commercial advertising would be separated from functional station signs in order to leave the latter in possession of the foreground. Unfortunately, the most sought-after (and, of course, remunerative) sites are those which dominate a station. Only very careful siting of station signs in relation to advertising, and the use of legible lettering and suitable colours—such as are now to be introduced—will overcome this problem. At present the confusion is increased in some cases because the Regional colour concerned is not sufficiently brilliant to stand out from colourful advertising displays. Further improvements can be made, whenever station improvement schemes are in progress, by seizing the opportunity to group commercial advertising sites. The policy of minor station improvements will continue alongside implementation of the corporate identity programme. Already many stations on all Regions have benefited from face-lift schemes of this kind, at relatively small cost. London's main-line termini are among those receiving such attention and one or two LMR suburban stations in the London area will be among the first to receive the new corporate identity elements.

Complete implementation of the programme will obviously take some years. All new features of modernisation, such as stations, Liner trains, ships, etc., can be imprinted with the new look right from the start, but generally the scheme will go hand-in-hand with routine renovation, repair or replacement schemes; stations, for example, will only be dealt with as they become due for a facelift or other modification. A phased programme, with priorities selected from the points of view of practicability and desirable emphasis, will be related to a strict control of annual cost. Nevertheless, sufficient evidence of the new corporate identity should be apparent by the end of this year to make an effect upon the public image of BR.

Credits: Design Research Unit, consultants to the Design Panel, British Railways Board: for general development work on the corporate identity. Jock Kinneir: station signposting.

ARCHITECTURE: Application of the corporate identity to architecture will mainly be in conjunction with facelift schemes, or new construction. Uniformity of colour for decor and fixed equipment will be avoided, and paintwork colours will be chosen to suit each individual application, its surroundings and its architectural style. Use of the new corporate identity elements—symbol, logotype and house colours—will be restricted to fascias and nameboards. Advertising, of course, will also display these elements in most parts of the station. Illustrated are theoretical applications to several different types of station; Hampton Court shows how an old station can be treated without submerging its character; Coventry typifies the best of modern rail architecture.

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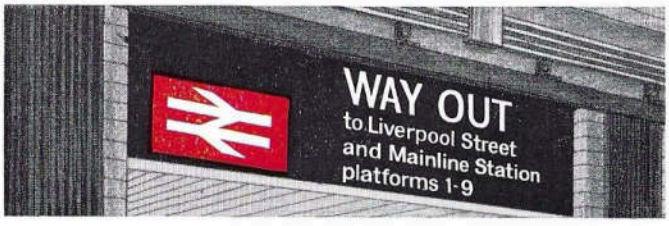
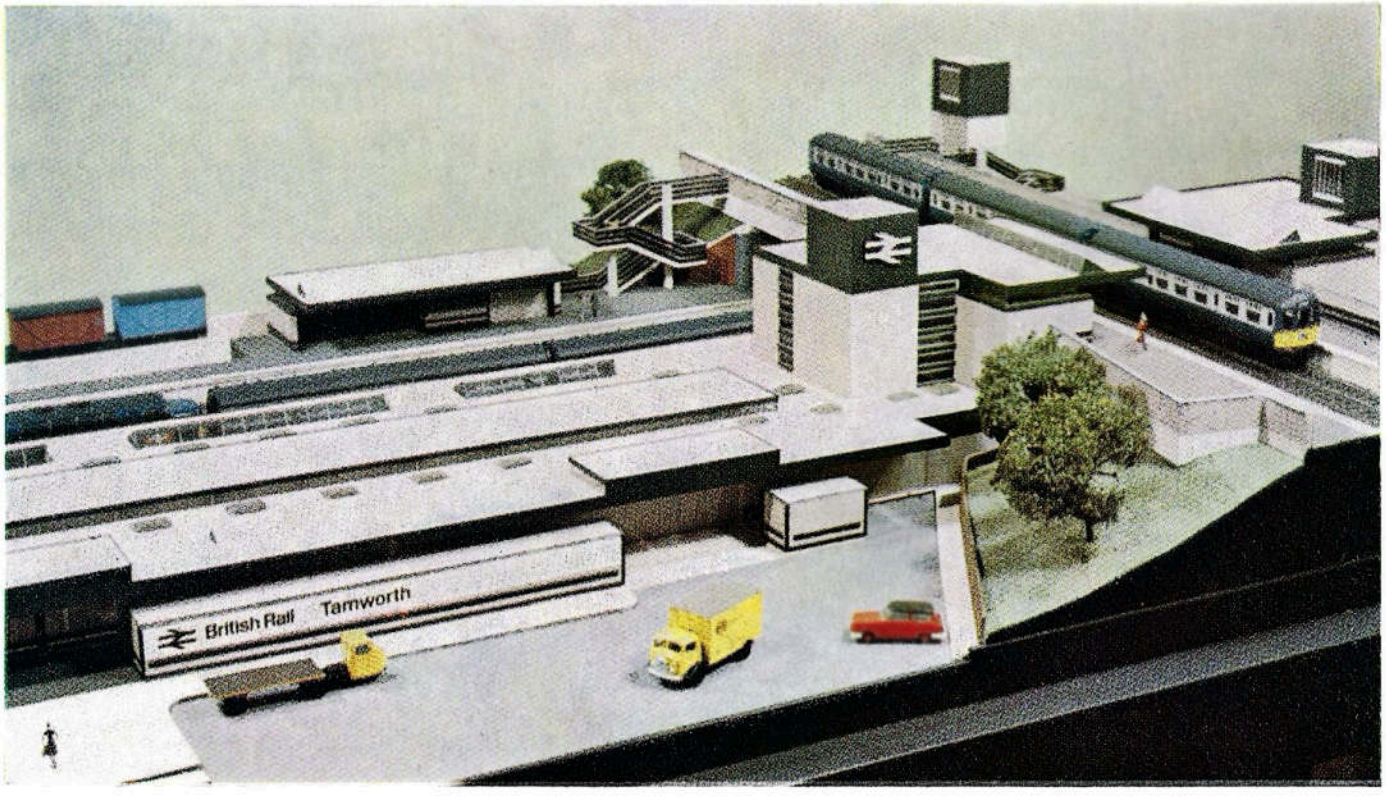


Architecture—*continued*

STATIONS: Victoria illustrates the effectiveness of the new style in a large-scale application. The directional sign is an effective use of the symbol to show a rail entrance. Tamworth, represented by a scale model, integrates all the elements of the programme—symbol, colours and logotype.



The cab of an English Electric Type 3 diesel electric locomotive fitted with the new Driver's Safety Device. On the floor (**right**) is the pedal. The hand switch is just below the cab window (**centre**) with the warning buzzer sited on the same level further left.

BRITISH RAILWAYS TEST BELGIAN RAILWAYS VIGILANCE DEVICE

FOLLOWING a fresh study of the whole problem of driver reaction to the environmental conditions in modern motive power units and a review of the provision of more comprehensive safeguards, British Railways will soon begin trials on four locomotives (two BR/Sulzer Type 2 diesels, one English Electric Type 3 diesel and one a.c. electric locomotive) with a new "Driver's Safety Device". This is based on the driver's safety pedal used by the Belgian National Railways. It meets the safety requirement that a locomotive must be stopped should the driver collapse at the controls, that the driver must be alerted should he become drowsy, and that the locomotive must be stopped should he fail to respond to the device's warning.

The title, "Driver's Safety Device", or DSD for short, has been chosen to avoid any suggestion that it is a safeguard only against the remote contingency of a driver dying at the controls. Its name will properly indicate that it assists the driver at all times and under all conditions. DSD will initiate a full brake application after a predetermined delay period and also cut off power from the traction motors whenever the train pipe vacuum or air brake pressure falls below a pre-set minimum.

The device comprises a three-position "balanced zone" foot pedal, hinged at the trailing end and designed for operation by either foot. The three positions—released, balanced and depressed—are well defined by changes in the spring pressure against the foot. The pedal, which must normally be held in the balanced position, is placed centrally on the foot rest, but rises above it so that a driver's foot will slip off easily should he release all muscular control.

Because in some cases of illness or collapse a driver might apply his full weight to the pedal it is also designed to act in the depressed position. Thus, if the pedal is depressed or released a warning buzzer sounds immediately, and 5–7sec later the brakes are applied unless the pedal is restored to the balanced position. This warning overcomes the difficulty experienced with some of the earlier pedals, which could be released and cause the brakes to be applied without alerting the driver. An electric buzzer in each cab provides the audible warning, and to make it distinctive a pulsating relay interrupts the buzzer at half-second intervals.

In addition, the pedal must be depressed and returned to the balanced position once every 60sec or less in order to re-set a pneumatic time-delay relay which controls the brake operation. If this is not done, the buzzer gives immediate warning and 5–7sec later the brakes are applied. Belgian experience indicates that this requirement presents no extra burden to the driver, either physically or mentally.

The pedal is placed on the foot rest at the best ergonomic position, so that the angle between the foot in the working position and the leg is approximately 90 deg., a position that produces the minimum strain on the driver. Similarly, the pressure needed to hold the pedal in the working position is the minimum; a greater effort is needed to set the pedal in that position and to depress it fully.

Two hand push-switches are provided, one on the off-side of the cab and the other on the left of the driving position. The function of these switches is confined to preventing the alarm and brakes operating if the driver wants to release the pedal. The switches only neutralise the system for periods of up to one minute—the unexpired time after the driver has carried out the regular "depressed" movement. This will enable him to look out and make other checks without having to keep one foot on the pedal. The arrangement of the new equipment will still enable all standard locomotives to be coupled up for work in multiple-unit.

The method of operation is that movement of the foot pedal actuates a spring-loaded double-acting cam to open or close the contacts on the two micro-switches; the hand switches are single-pole off-on type. There are two principal relays: an instantaneous unit (the buzzer relay); and a time-delay unit (60sec vigilance relay). Both are energised through the DSD micro-switches (the buzzer relay via contacts on the vigilance relay). Two pairs of contacts in the supply circuits to the emergency brake valve and the warning buzzer are controlled by the buzzer relay.

The electrical supply for the switches, relays and buzzers is taken through the main controller in the driving cab, but is only energised when the controller is in the forward or reverse position. When the forward or reverse position has been selected, the buzzer sounds immediately and continues until the pedal is depressed (to set the 60sec relay) and brought back to the balanced position. In this position, the feed to the vigilance relay is discontinued, contacts in the supply circuits of the buzzer relay and emergency brake valve remain closed, and contacts in the buzzer supply remain open, i.e., the brake valve is energised with the buzzer suppressed.

After one minute, the contacts on the vigilance relay open to break the circuit to the buzzer relay, which in turn operates contacts to de-energise the emergency valve, sound the buzzer and, 5–7sec later, apply the brakes. Should the pedal be released or depressed from the working position, the feed to the buzzer relay is discontinued with the same effect.

A miniature circuit-breaker in each cab serves the dual purpose of protecting existing auxiliary equipment against failure of the vigilance apparatus and also of isolating this apparatus should trouble occur. In these circumstances the existing isolating cock in the pneumatic circuit is closed.

THE BRB RESHAPES ITS COMMERCIAL ORGANISATION

To bring its commercial organisation more into line with present and future needs and with the greatly increased commercial activity at Board level, the BRB has divided the responsibility for passenger and freight business. Mr. R. A. Long, as Chief Commercial Manager, is concentrating on commercial planning, liaison with the Regional organisations, traffic survey and customer research and will become executive member of the Board's Commercial Committee. He will report to the Members of the Board responsible for commercial matters, Messrs. S. E. Raymond (Vice-Chairman) and Mr. L. H. Williams. Mr. S. C. Robbins, as Chief Marketing Manager, is assuming responsibility for the whole of the freight marketing effort and he also will be responsible to the commercial Members. Mr. J. H. Nunneley, as Chief Passenger Manager. will be responsible for all headquarters passenger matters and report direct to Mr. Raymond. To ensure that the Board's commercial policy is fully integrated, a Headquarters Commercial Committee has been set up, consisting of Mr. Raymond as Chairman, Mr. Williams and the three Managers mentioned. This committee will deal with matters of policy and co-ordination and will have overall responsibility for the development of the commercial organisation throughout BR in conjunction with the General Managers of the Regions.

"Blue Trains" treble North Clyde revenue

—but the traffic potential on South Clydeside is greater still

G. Freeman Allen

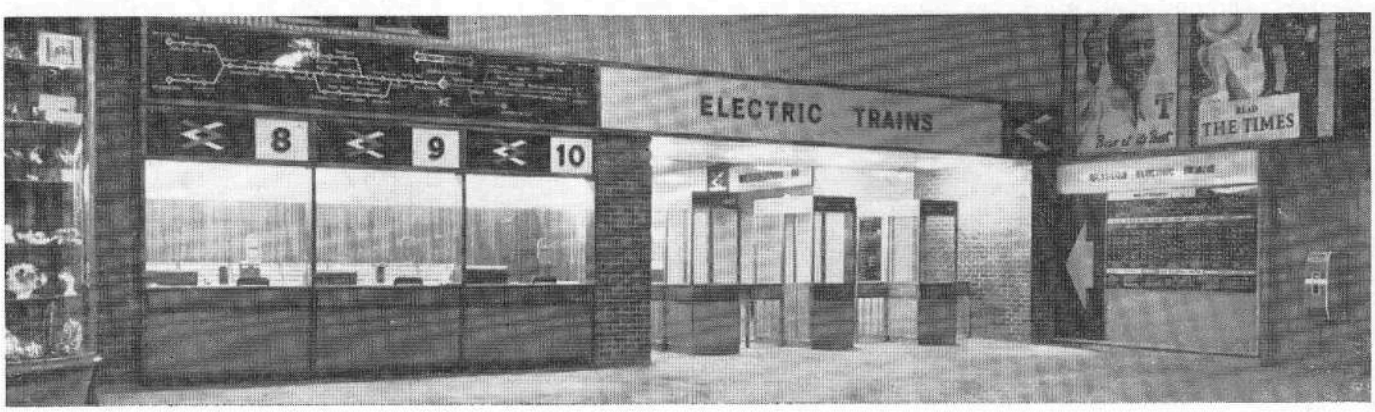
"THE people of Glasgow have supported the 'Blue Trains' north of the Clyde in no uncertain way—takings have trebled in three years—and this has played a big part in our decision to go ahead on the south side of the river, where we feel the possibilities are even greater."

This was how Mr. W. G. Thorpe, Chairman of the Scottish Railway Board, explained to a Glasgow audience the BRB's decision, approved by the Ministry of Transport, to go ahead with the £6½m extension of the Glasgow suburban a.c. electrification to Gourock and Wemyss Bay. The extent to which patronage of the North Clydeside electric trains has inspired Scottish Region's confidence was apparent from Mr. Thorpe's disclosure that the existing steam services on the Glasgow–Gourock/Wemyss Bay lines are losing about £300,000 a year.

Approval for this fresh electrification in Glasgow came almost three years after the opening on November 7, 1960 of the first "Blue Train" service, over 52 miles between Airdrie and Helensburgh/Balloch via Glasgow Queen Street Low Level. Despite the disastrous electrical equipment failures which forced withdrawal of the "Blue Trains" not long after their inauguration and kept them out of service for a protracted period, this initial service has steadily increased its passenger carryings. In the third year of operation just completed, for example, there was a further increase of 13.6 per cent in revenue over the second year and the annual takings are now 191 per cent up on those of the last year with steam. Some stations are producing over 400 per cent more revenue than they were in 1961; at Dalmuir Park, for instance, the annual returns have risen from some £3,000 to £22,000.

Similar success has been won on the South Side of Glasgow. "Blue Train" services were inaugurated from Glasgow Central to Cathcart, Neilston, Kirkhill and Motherwell on May 28, 1962 and in the first week patronage of Cathcart Circle

Glasgow Queen Street Low Level—the rush hour scene on the platforms **(above)** and the well-designed booking office, with the "Blue train" symbol prominent above the windows, at ground level **(below)**. *Photos by British Railways*



station was almost trebled. On average, revenue from these routes has jumped by nearly 200 per cent since they were electrified, but overall the commercial achievement on this side of the city has not been as outstanding as on the North Clydeside lines because the traffic potential was lower. Particularly is this the case with the Cathcart Circle, which was incurring heavy losses before its conversion—so much so that many experts considered it an extremely dubious candidate for electrification.

The potential of the North Clydeside and Glasgow South electric services is probably not yet exhausted. Although daytime road congestion in Glasgow is apparent in many places, traffic has not yet reached the saturation level of, for example, London. So far, Glasgow has no parking meters and it is not impossible to find space for one's car in the neighbourhood of the city centre during the day. For this reason, despite the provision of car parks at the reasonable user charge of 1s a day (Glasgow Central apart), the Scottish Region has so far been disappointingly unsuccessful in stimulating people to "park and ride", except at Helensburgh and, to a lesser extent, Balloch. Nevertheless, the "Blue Trains" are attracting an encouraging off-peak traffic, particularly amongst women shoppers, who can take their prams with them on the trains after 10.00. Indeed, the off-peak traffic between Airdrie and Helensburgh is now running at a heavier level than the peak traffic in steam days, partly thanks to some bold cheap fare offers.

97 per cent on time record

The operating performance of the North Clydeside "Blue Trains" since the equipment troubles were rectified has been impressive. With the acquisition of experience and the development of operating teamwork, the incidence of delays has been steadily reduced to the point where, in August last, of some 9,000 trains run during the month, only 146 ran late. In most months nowadays the on-time record of the service is as high as 97 per cent.

The peak-hour working over the central section of the North Side route, between Bellgrove and Hyndland, is hectic. Although the rush-hour traffic at Queen Street Low Level is comfortable by London West End standards—a recent census showed about 5,000 incoming passengers to be handled there between 8.00 and 9.00 and nearly 6,000 between 17.00 and 18.00—the point-to-point times and station allowances demand very smart working and station operation. The trains are timetabled at 3min headways (though the signalling will allow 1½min if working gets out of course) and the stopping trains which make up the greater part of the service are generally allowed only 30sec each at Queen Street, High Street and Charing Cross, with 20sec stops at other stations except Dumbarton.

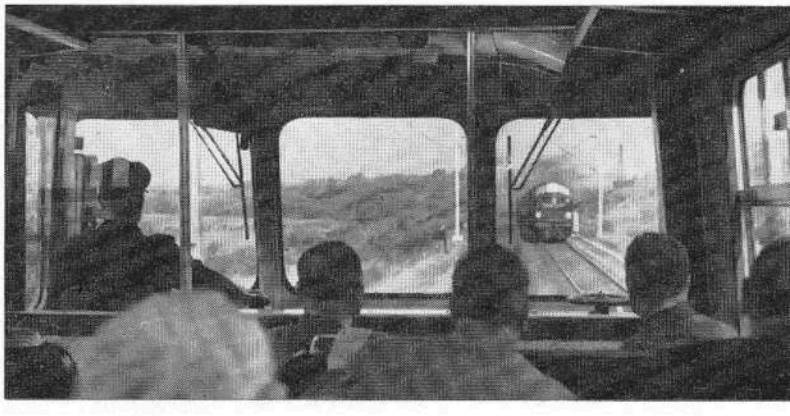
To keep schedule drivers have to exploit fully the acceleration and speed potential of the "Blue Trains". At the height of the working, most trains are still hitting as high as 40 m.p.h. when their cab front comes level with the platform end at an intermediate stop. Of course, there is a corollary of heavy brake block wear and blocks have to be changed every five days. There is evidence, too, of the high-pressure working in the discoloration of many coach body undersides. The system's mechanised coach-washing methods have a job to cope with brake dust deposits, particularly over recessed areas of the body such as the sliding doors—hence the unsightly brown smears which on all too many "Blue Trains" belie the fact that they undergo an exterior water wash every second day and a detergent clean every fourth day.

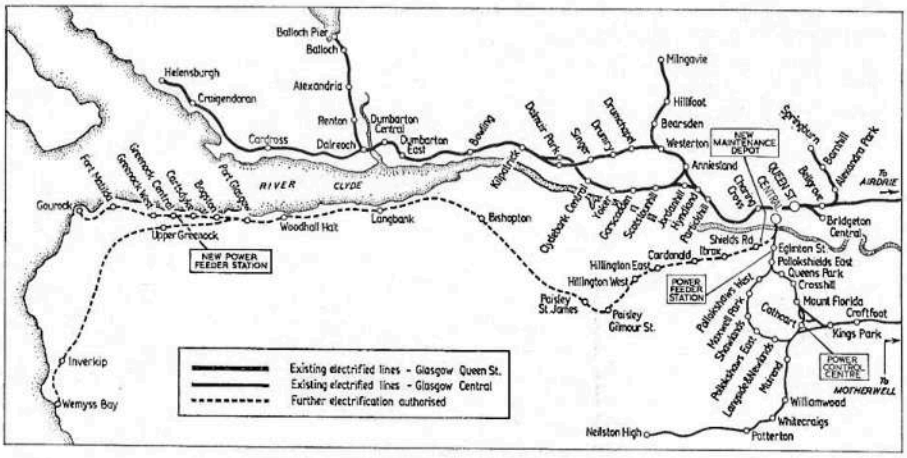
A memory of the abortive rail-bus co-ordination scheme in Glasgow—Kings Park station, with a bus from the Castlemilk housing estate in the foreground and a "Blue train" behind. *Photo by W. S. Sellar*

Public treats trains proudly

Recurrent vandalism by young hooligans interfering with the traction current wires and disrupting the train service has been a serious problem on the "Blue Train" network. The travelling public, however, has treated the stations and rolling

Propaganda for the "Blue trains" has justifiably made much of the panoramic view from seats behind the driver. These pictures show a glimpse of North Clydeside, between Charing Cross and Partick Hill, from a Springburn–Milngavie train (**left**) and the up "Royal Scot" seen from a South side train near Motherwell (**right**). *Photos by S. Rickard, British Railways*





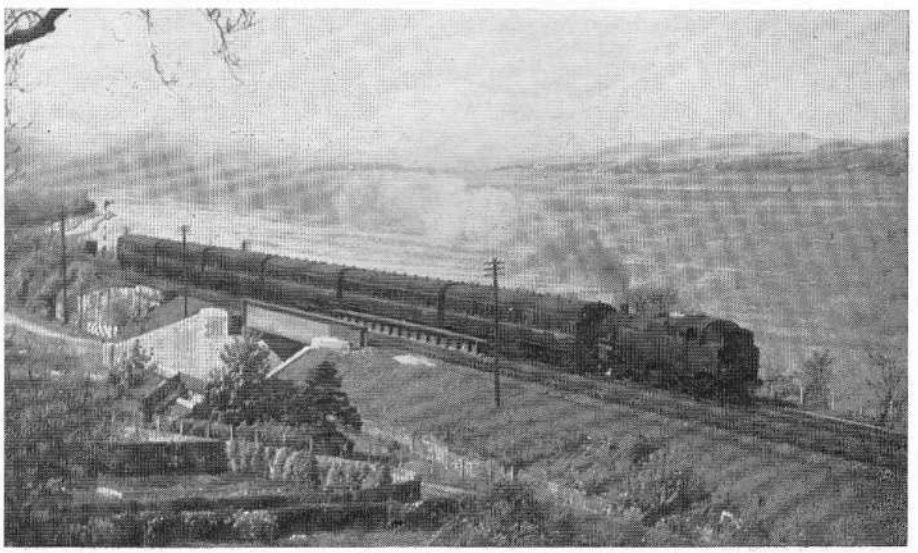
Above left: Study of a "Blue Train" front end at Dumbarton.

Above right: A map of the existing electrified routes in the Glasgow area and those now to undergo conversion.

Centre left: A "Blue Train" from Airdrie enters Helensburgh Central.

Below left: Mount Florida station on the Cathcart Circle.

Below right: A scene on the route now to be electrified—Class 4 2-6-4T No. 80107 on South Clydeside near Langbank with a Gourock–Glasgow train on May 23, 1963.
Photos by B. A. Haresnape, S. Rickard, British Railways, J. A. N. Emslie



stock remarkably well. The train interiors look far less soiled than some of those of commuter electric services in the South—and Glaswegians do not seem to be so prodigal with their litter either.

On the North Side lines, from Airdrie to Helensburgh, Springburn to Milngavie and Bridgeton Central to Balloch, the weekday timetable provides 328 services, of which 240 are by three-car sets and 88 by peak-hour six-car formations. As already remarked, most are stopping services, but in the peak hours there are two semi-fast and one fast train from Helensburgh to Glasgow, with two balancing fast trains back in the evening. The fast trains cover the journey from Helensburgh to Glasgow in 31min, as against a best of 43min in the previous steam schedules.

The existing "Blue Train" units are cleaned at Bridgeton Central, where the carriage-washing machine is installed. The maintenance depot is at Hyndland, which cares for all 91 three-car units now at work; of this total 46 are allocated to the Glasgow North workings and 28 to the Glasgow South services, while daily requirements for maintenance, overhaul and stand-bys cover the remaining 17. The average weekly passenger train-miles covered by each unit on the Glasgow North services total about 1,000.

The South Side electrified lines are isolated from those to the North, with the result that units scheduled for cleaning at Bridgeton or maintenance at Hyndland have to be hauled dead across the centre of Glasgow. The economics of electrifying a connecting line from Shields Junction to the North Side were given a careful appraisal, but it was deemed more prudent to tolerate the short-term inconvenience of using the Hyndland depot, because any extension of the South Side scheme would necessitate the provision of a separate maintenance depot in this area. In connection with Stage II, now authorised, a second maintenance depot is to be built at Smithy Lye, near Shields Junction, to serve both the existing South Side lines and the extension to Gourock and Wemyss Bay. When the latter is completed, the 19 new three-car units being built for it will be merged with the sets in current use on the Neilston, Cathcart and Motherwell routes.

Gourock should have come first

The Glasgow–Gourock and Wemyss Bay electrification holds considerably more commercial promise than either of the schemes which preceded it. Whereas the population of the four principal centres served by the North Side "Blue Trains", —Helensburgh, Balloch, Dumbarton and Clydebank—totals 96,000, that of Gourock, Greenock, Port Glasgow and Paisley combined is at least 205,000; Paisley alone has more than 100,000 inhabitants. Lengthy tracts of country along the lines now to be electrified are ripe for development and, recollecting the haste with which speculative builders pounced on the Craigendoran area after the first "Blue Trains" were introduced, it is easy to conceive what electrification will do for the south bank of the river. The possibilities for attractive housing development are far more extensive here and the existing plans of local authorities budget for an 11 per cent population increase in the next 10 years, with a rate as high as 16 per cent in the towns furthest from the city centre. Moreover, Gourock and Wemyss Bay are termini for the Clyde steamers, which will link the new "Blue Trains" with a further 30,000 people; undoubtedly electrification will make public transport travel to and from Glasgow more appealing to Dunoon and Rothesay, particularly as prompt connections between the trains and boats are promised, although naturally the prospects in this direction are nothing like those from development on the south bank. Nevertheless, local railwaymen believe that Dunoon at least may develop significant Glasgow commuter traffic.

As MODERN RAILWAYS inferred a month or two back when the Glasgow Stage II scheme was first announced, it has always been mystifying that the Gourock line, with its much higher traffic potential, was not the first on Clydeside to get "Blue Trains". Locals suspect that it may have been passed over in favour of the Helensburgh and Balloch lines under some deal with Glasgow Corporation to apportion spheres of public transport interest between road and rail. Some Glaswegians remark, moreover, that the South Side "Blue Trains" were planned to run beyond Motherwell to Lanark and round the loop through Hamilton Central to Newton and back to Glasgow—services which are now covered by diesel multiple-units under the Scottish Region's "Green Train" brand name—and here again hint at appeasement of the public road transport authorities as at least an important factor in curtailment of the original project. On the other hand, the BTC would probably have refused to risk any electrification without an agreement to regulate competition.

The Scottish Region has quoted some other considerations which, it says, influenced the decision in October to go ahead with Stage II. There is, first, the Government plan for the development of the central industrial belt in the south Clyde area, which should bring increased employment and more commuter and business travel to and from the district. A useful feature of the South Side traffic already, from the BR viewpoint, is the existence of several cross-flows of peak-hour traffic, which will help to balance the working. In addition to the commuters in and out of Glasgow, there are appreciable groups travelling to work in Paisley, and from both the Glasgow and the Gourock ends of the line to the massive Royal Ordnance Factory at Bishopston. (Bishopston station, which was recently given a £1,500 facelift, is the only wayside station one remembers seeing in this country with automatic hot drink-dispensing machines for the benefit of its customers; these have been installed primarily with an eye to the ROF workers going on and coming off the night shift.)

Public prefers electric to diesel

BR are confident that the faster timings of the "Blue Trains" will combine with the inevitable worsening of traffic congestion in Glasgow to make the use of a car less appealing. Car parks will be introduced or improved at most of the principal stations, especially Wemyss Bay, Paisley and Fort Matilda, though it will be difficult to find room for a park at Gourock.

Market research on the North Side "Blue Trains" has convinced the Scottish Region that a fast regular-interval service with modern, comfortable rolling stock of this character generates new travel. Passenger samplings showed that about 40 per cent would have made no journey at all if the "Blue Trains" were not available. Another interesting finding was a marked preference for electric as opposed to diesel traction. For every ten people who would use a modernised electric service, only eight or nine would be induced to travel on a service modernised with diesel traction; generally speaking, the public had the impression that electric traction was quicker, more frequent, more reliable and that as a rule it offered a much higher quality of service.

The present total passenger movement by road and rail in the area served by the Glasgow–Gourock and Wemyss Bay lines is assessed at about 6.6m passenger-miles a week, of which 30 per cent travel by rail, 40 per cent by bus, 20 per cent by car and 10 per cent by other means. Taking into account both population increases anticipated and the new travel which, on past "Blue Train" experience the new service can be reasonably assumed to generate, the weekly total should rise to about 7.35m passenger-miles by 1970. With Stage II then fully operative, the Scottish Region expects the travel pattern to be 53 per cent by rail, 24 per cent by bus, 13½ per cent by car and 9½ per cent by other means.

Four tracks cut to two

Glasgow Stage II involves electrification of 37 miles of line beyond the junction with the present South Side network at Cook Street, Glasgow. The employment of electric traction for the passenger traffic and diesel power for all freight working, in conjunction with thorough modernisation of the signalling, will enable a considerable amount of duplicate trackage to be recovered. The 4½-mile stretch of four tracks between Shields Junction and Arkleston Junction will be reduced to two and the Port Glasgow–Wemyss Bay section will be worked as single track. The first of these economies will embrace Paisley Central station, where only two platforms and one side of the present four-platform structure need be retained. Whether, however, there will be any buyers for the land thereby released in the centre of the town seems presently uncertain—which no doubt explains the absence of specific reference to any remodelling at Paisley in the official announcement; the latter merely observed that an extensive programme of station modernisation and facelifting is to be carried out.

The current supply to the trains will be at 6.25kV a.c. from Cook Street to Shields Road and 25kV a.c. for the rest of the extension. Electricity from the South of Scotland Electricity Board will be fed to the newly converted lines through the existing feeder station at Eglinton Street and a new one at Greenock. The electrical control set up at Cathcart for the previous schemes will serve the new electrification.

No less than £1.86m of the £6½m total cost of Stage II is earmarked for resignalling with colour-lights throughout the extension area. The huge Glasgow Central power box was built with capacity for later extension of its coverage, which is now to reach to Paisley Junction, and the 40 signalboxes at present controlling the lines to be electrified will probably be reduced to eight. Resignalling is the biggest single exercise of the scheme and will take about 18 months to finish; it includes installation of AWS.

More and faster trains

Today's steam service offers a train an hour to Wemyss Bay, two an hour to Gourock in the off-peak and three an hour in the peak. The draft regular-interval timetable for the future meshes a Glasgow–Ayrshire coast diesel multiple-unit service, needing 32 three-car units, with the Glasgow Central electric train departures to South Clydeside. There are likely to be fast diesel trains to the Ayrshire coast on the hour and half-hour, fast "Blue Trains" to Gourock at 10min past and to Wemyss Bay at 40min past each hour, and stopping "Blue trains" to Gourock at 20 and 50min past each hour. In the peak hours there will be five trains between Gourock and Glasgow, into the city in the morning and out at night, of which one in each group will be the line's only non-stop services. Journey times will come down from 48min for today's best over the 26 miles between Gourock and Glasgow Central to 37min by the fast "Blue Trains", probably stopping intermediately at Greenock, Port Glasgow and Paisley; stopping electrics will take 55min, as against 72min by an all-stations steam train nowadays. A Glasgow–Wemyss Bay fast electric will be timed in 45min for the 31 miles, compared with 57min by steam.

A special passenger traffic requirement to be considered is the transatlantic business generated by the Canadian Pacific and Cunard sailings from the Clyde, which averages about 300 people a week. At present they are ferried to and from the liners by tenders connecting with Greenock Princes Pier, at the end of a 5-mile branch BR want to close. Negotiations have been going on in the hope of transferring this traffic to Gourock. From there the boat traffic would be run in "Blue Trains" on special workings, which can be economically organised from spare stock as the boat traffic demand is always in the off-peak.

Spur to co-ordination?

When he announced the Stage II scheme in Glasgow, the Chairman of the Scottish Railway Board was careful to couple with it a hope of effective public transport co-ordination on Clydeside. "It will," said Mr. Thorpe, "be necessary to examine the spheres of influence of public transport in the Clyde area to ensure that each type of transport undertakes that part of the task it can do best and therefore provide for the people the most economic and efficient transport service."

That failure to co-ordinate their public transport is costing them dearly seems, gratifyingly, to be dawning on a growing number of Glaswegians; and no one seems more conscious of it than the present Lord Provost himself, which is especially heartening. The gain of the initial "Blue Train" services has been increasingly Glasgow Corporation's loss on their buses. Similar BR success on South Clydeside could drive another gaping hole in the buses' revenue—and hence in the ratepayers' pockets, so far as the territory out to Paisley is concerned, and the nation's in the area beyond, which is served by the Transport Holding Co's Western SMT. Glasgow's first exercise in road-rail co-ordination is on the record books as a failure, but only because the bus operators' heart was not in it; the Corporation could not bring itself to take off the four through buses an hour to the city centre which the arrangement of local buses from the Castlemilk estate to connect with "Blue Trains" at King's Park was supposed to replace, primarily in the hope of reducing traffic congestion in the heart of Glasgow. As a result the co-ordination scheme wastefully enlarged transport capacity without the justification of increased demand and inevitably losses were incurred.

There is far too much senseless duplication of road and rail routes in the Glasgow area. Rationalisation could make some worthwhile inroads into the losses on the Corporation's buses, which increasingly worry the city's councillors. It is not only railwaymen, therefore, who are hoping that approval for this new "Blue Train" scheme will be the stimulus to formation of an effective body for co-ordination of all Glasgow's public transport services in the interest of both the farepaying and the ratepaying public.

POWER SIGNALLING FOR GUILDFORD

THE SR is spending £½m on re-signalling in the Guildford area. Colour-light signalling will be introduced on 34 route miles bounded by Farncombe and Bramley, Shalford and Ash, and Woking and Effingham Junction, the whole to be controlled from two new signalboxes that will replace 10 existing cabins. There will be a new box at Guildford station instead of the present two at Guildford South and Guildford Yard; the other box, at Ash, will also control automatic lifting barriers at the existing level crossing. The new boxes will have press-button control panels, employing miniaturisation and "plug-in" units (which can be interchanged quickly in the event of failure without disturbing wiring), and will incorporate automatic digital berth train describers, which will also be installed in the fringe electro-mechanical boxes at Effingham Junction, Woking, Farncombe and Shalford. This may be adapted for automatic routing at certain junctions. Electronic teleprinting apparatus also will be linked to the train description equipment, to provide a permanent automatic record of all trains passing through the area and eliminate the manual recording work of booking lads. Prerecorded announcements (on tape) will also be actuated by the train description system, to relay information automatically over the public address system at stations as the train approaches. As already reported, these new developments are to be incorporated in the signalling programme for the Southern's Bournemouth electrification scheme, to be completed by summer 1967, but Guildford will be first in the field as its new signalling will be in operation by Easter this year. The Guildford scheme will achieve a significant saving on manpower; for example, an area at present requiring 16 signalmen will be controlled from the Guildford box by six men, working in shifts of two at a time.

The contractors employed on the Guildford scheme are SGE Signals (Wembley)—signalling; AEI—cabling and cable route construction; and Henry Williams (Darlington)—provision of control panels at Guildford and Ash.

UNEASE ON THE BOURNEMOUTH LINE

For many people south-west of Basingstoke pleasurable anticipation of electrification is increasingly tempered by disquiet at travelling prospects until it is finished, since the Waterloo–Bournemouth–Weymouth service looks likely to remain steam-operated until then. The SR's own Type 3 diesels cannot be switched to all-year-round employment on this route as they are equipped for electrical train-heating only and dual-heated coaching stock does not appear to be available in sufficient quantity for transfer from other Regions. Complaints of poor performance by the route's present steam power are multiplying, particularly from London commuters in the Winchester area. Partly these are due to the run-down state of a proportion of the Bulleid Pacifics, as a result of BRB insistence upon minimum steam locomotive repair expenditure. New influences on the situation are the closure of Nine Elms as a maintenance depot, so that there are no spare locomotives in the immediate neighbourhood of Waterloo, and the introduction to the Exeter–Waterloo services of diesel traction based on distant depots. If a WR "Warship" diesel is failed after arrival at Waterloo, there is no diesel substitute on hand. Because of the diesels' short turnround allowance, all that the Waterloo operators can do is to re-shuffle the steam power in terminal's immediate vicinity, which may result in a rostered Bournemouth train Pacific taking out an Exeter service and the Bournemouth train being left with the next best thing—on occasion even a Class S15 4-6-0.

THE TAUNTON FREIGHT CONCENTRATION CENTRE

Mechanisation with two unique features—sundries and coal are handled on the same premises; and the coal plant is BR-financed

TAUNTON'S £300,000 freight concentration centre, officially opened on November 17 last, is the first in the country to group a mechanised coal concentration depot on the same premises as a modern freight sundries and full-load depot. It is one of two major freight concentration centres which the WR is setting up in the West Country, the other being at Plymouth; the nearest secondary depots to Taunton dealing in both sundries and full loads will be at Exeter, Barnstaple, Bridgwater and Yeovil.

The previous allocation of road collection and delivery vehicles to Taunton has been almost doubled, from 17 to 30, and an area radiating some 30 miles from the town's freight centre is now served entirely by road. No local freight train workings survive anywhere in the Taunton area. The territory's one private siding, in the Watchet area, has been closed by agreement with the owner, a paper mill, whose traffic is now brought by road to Taunton and is claimed by the WR to be getting a better throughout transit in consequence. At present Taunton's concentration area is bounded by Minehead, East Anstey, Wellington, Burlescombe, Somerton, Ilminster and Martock. Ultimately the Taunton depot management hopes to cover a swathe of South-Western territory from the Bristol Channel to South Coastal towns as far distant as Seaton and Lyme Regis with its road collection and delivery services.

The rebuilding and re-equipment of the depot to fit it for wider greater responsibilities has been in progress for the past year. The sundries depot, which has two platformed tracks, one divided into received and forwarded sections and the other for transhipments, has been extended and provided with Lansing-Bagnall electrically-propelled tractors and lightweight trolleys for road-rail transfer. Wagons are made daily for 30 different destinations, including Glasgow and all the main traffic centres in the north. A new staff amenities block has been built and also a new road motor maintenance and servicing centre. In the first four months of its operation, the Taunton depot reports a traffic increase of 6 per cent, by comparison with what was formerly dealt with in its area; its business is now running at an annual tonnage rate of about 130,000 tons.

Operationally, the Taunton coal concentration depot is similar to some earlier installations in the London area, but in another important respect it is unique. Negotiations for its establishment were begun between the WR and local coal merchants pre-Beeching and before household coal concentration schemes became a cardinal point of BR re-shaping; thus they pre-dated the present policy not to invest BR capital in setting up a depot. The Taunton plant was financed entirely by the WR, which owns it, but it is managed by Taunton Coal Concentration Limited, a company jointly formed by BR and the local coal merchants. The WR undertook to supply by road from the new depot all merchants who previously took their coal by rail via local freight services now abandoned, though naturally the merchants were perfectly free to employ their own vehicles and in practice most do so. It was also agreed that after the depot had been in use for two years, the WR would be free to dispose of it, but that the consortium of local merchants would have first refusal at the original cost price less an allowance for depreciation. A local merchant told MODERN RAILWAYS that in his view the local trade could not afford to turn down the offer when it came, even though it might force up their retail prices; they could not risk any outside concern coming into their territory and buying up such efficient, mechanised apparatus over their heads. His attitude suggests that if the short-term capital can be spared, a national network of these depots could be set up more quickly and without ultimate loss by similar BR initiative elsewhere, rather than by waiting for the merchants to agree amongst themselves on investment.

The basic all-the-year-round rail service to the depot is in three 500-ton deliveries weekly, on Mondays, Wednesdays and Fridays, but paths are available to increase this to five deliveries weekly during the winter peak. The coal originates from four collieries in the East Midlands to schedules drawn up months in advance and is despatched in 20–25 wagon lots of 21-ton brake-fitted, bottom-discharge hopper wagons. At present each batch of wagons travels as a section of a through freight train from the Midlands to Bristol, but from Bristol it travels as an individual block train to Taunton, where the hopper wagons come on to the depot at 6.00. All are usually unloaded before 16.00 and they are returned to Bristol the same day on the 19.50 freight from Taunton. Ultimately, when the South-West's two other proposed coal concentration depots have been set up at Exeter and Newton Abbot, BR plan to run 1,500-ton block coal trains throughout from the East Midlands pits and

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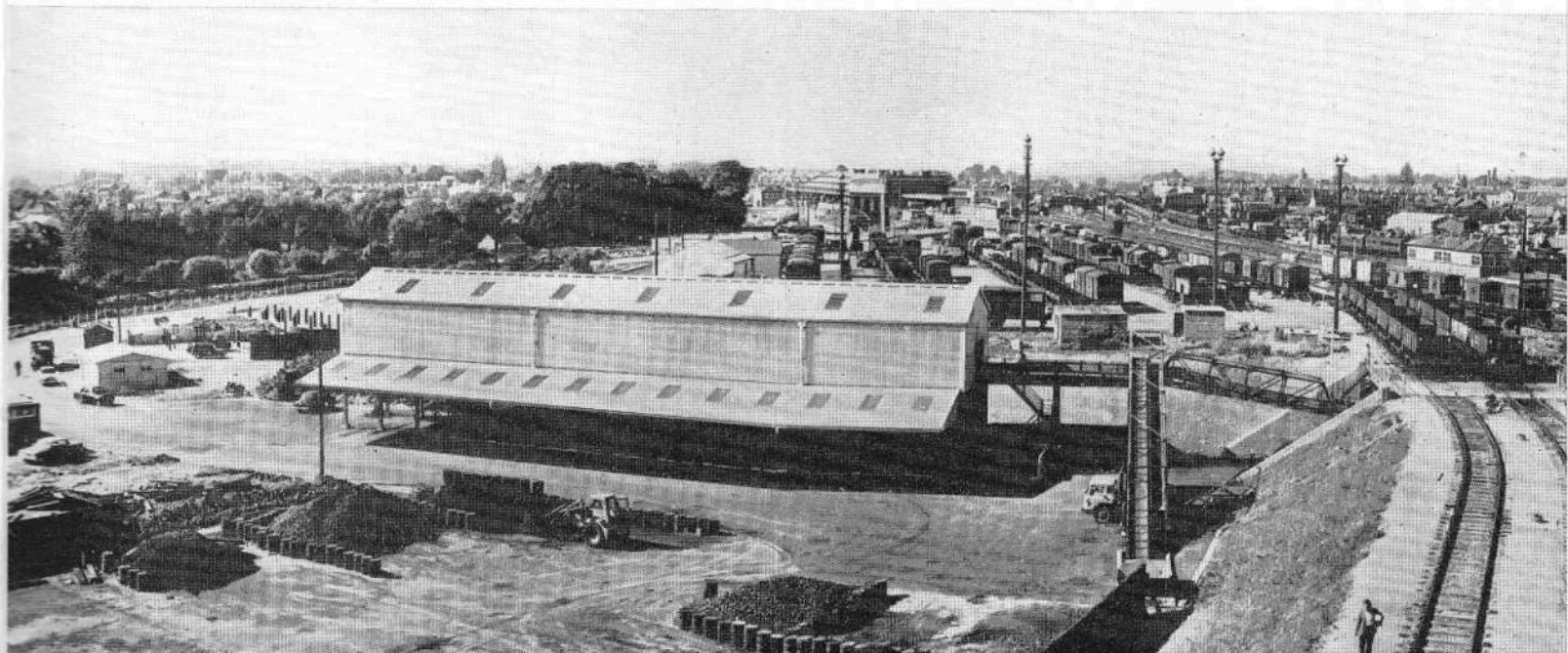
A general view of the Taunton freight concentration centre, with the mechanised coal handling plant in the foreground; the nearest hopper wagons are standing close to the unloading bridge from which a conveyor belt leads to the storage hoppers. The enlarged concentration depot can be seen on the horizon above the coal depot building and the main line approaches to Taunton station are visible in the right distance. At the head of the page are seen two of the Lancing Bagnall electric tugs used in the sundries depot.



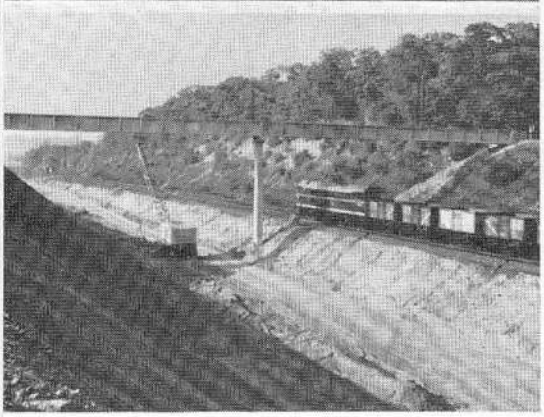
The Retford diveunder is taking shape

1

1 A view of the diveunder looking east, with the original route visible at the top left.

2 The new three-tier bridge structure at Ordsall Road seen from the east; the diveunder lines will be at the lowest level, down traffic from the East Coast main line towards Sheffield will pass through the new road bridge span, and the up line from Sheffield to Retford will take the old span on the right.

2



3 A Brush Type 2 diesel takes the old line in Whisker Hill cutting, which has been widened and deepened to accommodate the new diveunder lines.

4 An aerial view of the site looking towards Sheffield, with Retford station at the extreme centre right and the original flat junction with the East Coast main line to the left of it.

3

4

WORK is well advanced on the construction of the ER's £1m Retford diveunder, designed to carry the ex-Great Central east-west double-track (Grimsby–Sheffield) underneath the East Coast main line and eliminate the notorious Retford crossing, which dates from 1852. Completion of the project, which has required excavation of over a mile of new cutting and the construction of seven bridges, one on three levels, is scheduled for June 13, 1965.

During the past few years, the CEGB has initiated a series of massive coal-fired power stations along the Trent. High Marnham is already in operation and West Burton A, near Gainsborough, is in course of construction. These stations will obtain their coal from pits to the west of the East Coast main line and the fuel will be rail-hauled on a merry-go-round working. West Burton A station will consume 5¼m tons of coal per annum, which will require 21 or more additional trains per day over the east-west route. These could not be passed over the flat crossing at Retford without causing delays on both lines. The position would worsen should the west-east coal traffic be increased by further power station development.

A flyover was considered to replace the flat crossing at Retford, but the gradients and the extraneous works involved made this solution uneconomical. A diveunder, on the other hand, also created favourable conditions for the construction of a flyover at Whisker Hill. by which down traffic from the East Coast main line towards Sheffield could cross the diveunder lines and not hamper traffic from the collieries to the power stations. All but seven acres of the land required for the scheme were already owned by BR, which simplified the acquisition of the site and kept costs down.

The new diveunder lines are being constructed on the south side of the existing east-west lines, with the exception of a short section near the east end of the site, between the flat crossing and Thrumpton motive power depot, where the running lines have been temporarily re-aligned. Starting from the west end of the work, the new lines diverge from the existing alignment near the north-west corner of Retford golf club and enter Whisker Hill cutting, which has had to be widened and deepened. In the deepest part of the cutting, the line passed under a wrought-iron lattice girder footbridge, which has been replaced by a prestressed concrete bridge of two 90ft spans.

To the east of this bridge the new down Whisker Hill flyover line will converge with the diveunder line. The existing span of Ordsall road bridge will remain and will carry the road over the up Sheffield–East Coast main line connection, while a new three-level span is being built to carry the road over the flyover line, which itself will run above the diveunder lines. The flyover and road will be carried on prestressed concrete composite deck slabs, on reinforced concrete abutments. The wing walls and piers will be brick-faced to match the existing structure.

To the east of Ordsall road bridge, the diveunder lines enter a concrete-lined trough

section, which forms the inclines of about 1 in 100 to the intersection bridge and safeguards the new line in conditions of flood. A siding will be provided here to accommodate multiple-unit diesel trains turning at Retford. To the east of this siding, the line passes under West Carr road bridge, a prestressed concrete composite slab structure, which replaces a level crossing. Next comes Tunnel road footbridge, which replaces a former subway.

The diveunder now reaches its lowest point and passes under the East Coast main line, which is carried over it on a welded steel plate girder bridge of 38ft span. Provision has been made for raising this bridge by up to 14in in case of electrification of the east-west route. This bridge also carries a footway, which will be used by interchange passengers between the existing passenger station and the new low-level platforms that will start immediately east of the intersection bridge. Stairs will lead down to these platforms and a parcels lift will be built on the north side of the new lines. The platforms are being built integrally with the diveunder base and walls; facilities will be restricted to passenger shelters on both platforms, together with a porters' room adjacent to the lift, and a space for barrows under the stairway. To the south of the low level station, a pumphouse is being built to dispose of any surface water collecting in the diveunder inclines.

The diveunder rises at a gradient of 1 in 100 on the east side of the intersection bridge to cross the River Idle by a 56ft main span constructed of welded steel girders, and on either side, a flood relief span supported at its landward end on the existing abutment. East of the River Idle, the line intersects Thrumpton Lane on the level. This crossing will be retained, but operated electrically. A new reinforced concrete footbridge will replace the existing bridge to the east of the level crossing, beyond which the running lines will return to their existing alignment and level.

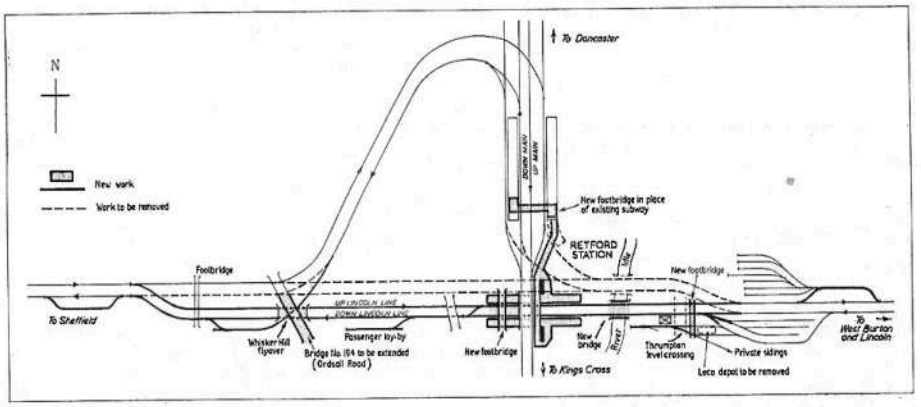
Additional works include a down goods loop already in commission at Rushey, about half-mile west of the diveunder works, and an up loop, to be installed east of Thrumpton. Thrumpton motive power depot is to be closed and the tracks leading to nearby private sidings will be simplified.

The main contract for the civil engineering work on the diveunder was let to Messrs Henry Boot and Sons (Civil Engineering) Ltd., and site work started at the end of November, 1963. The final ballasting and laying of the permanent way is to be carried out by direct labour. About 330,000cu yd of diveunder excavation is involved, all of which has been removed by lorry. At the site of the intersection bridge, the East Coast main line was placed on temporary way-beams installed during a series of Sunday possessions during last January and February. Excavation was then carried out for the abutments, which were completed by the end of May. At the same time, the permanent bridge was erected on a runway clear of the line. On June 14, the temporary spans were lifted away and the permanent span rolled in.

Rapid progress was made in the early part of last year with the three-level Ordsall road bridge which has now been re-opened to traffic. Work has now started on the placing of bottom ballast, and as this is completed in stages the BR district engineer will start laying the new permanent way, using temporary connections from existing lines at both ends to bring in his materials. An important job now getting under way is the soiling and seeding of the cutting slopes. The Bunter "rock sand", which is prevalent throughout most of the site, stands almost vertically when dry, but is very susceptible to scour from running water. It is therefore essential to get the slopes stabilised by well-rooted grass. It is planned that these works should be completed by early May, giving time for testing signalling, etc., preparatory to a change-over to the new alignment on June 13, 1965, the day before the introduction of the summer timetable.

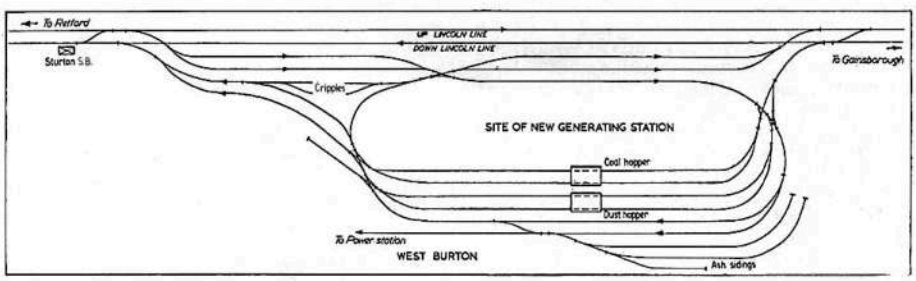
For the changeover on June 13, temporary closure of both the East Coast main line and the Great Central line will be necessary, as well as of the roadway at Thrumpton Lane. The bulk of the work on that day will be on the permanent way, making the new connections at the junction west of Whisker Hill, connecting the flyover at the site of the present Whisker Hill Junction, removing the flat crossing and other redundant track at the south end of Retford station, and making the new connections at the east end of the diveunder. After the changeover, some fairly considerable works will remain to be done, including the removal of redundant permanent way, the construction of three footways (Tunnel Road, Retford Station interchange and the River Idle), the demolition of the northern half of the River Idle bridge and the reconstruction of Thrumpton Lane footbridge. All these works are expected to be complete by the early autumn of 1965.

The removal of the flat crossing will enable minor re-alignment of the East Coast main line to be carried out, as well as an increase in the super-elevation on the curve at this point to allow a relaxation of the existing speed restriction of 65m.p.h. to 80m.p.h. Colour-light signalling will be installed on the Great Central line between Checkerhouse, four miles west of Retford, and Clarborough Junction, 3¾ miles east of Retford. Between these two boxes only Thrumpton Crossing box will remain; this is to be equipped with a route-setting panel and it will control the connecting link to the East Coast main line. Four mechanical boxes —Rushey Siding, Whisker Hill, Gringley Road and Welham Road—will no longer be required. Electrically-operated lifting barriers will be installed at Thrumpton and Gringley Road level crossings, operated from Thrumpton signalbox, while similar barriers will be installed at Rushey Siding level crossing, controlled by a gatekeeper at the adjacent Mansfield Road crossing. There will be no alteration to signalling on the East Coast main line, where the existing semaphores will continue in use.



Above: The layout at Retford showing the new works which are being undertaken and the track work which will be removed after their completion.

Below: The track layout which will be installed at West Burton power station, east of Retford, for merry-go-round coal train working.



THE TAUNTON FREIGHT CONCENTRATION CENTRE

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these will detach 500-ton sections at each depot. The depot's patent fuels come from South Wales in 100-ton lots, which travel in ordinary freight services.

The design of the coal depot ensures that at every transfer point during unloading the coal has the minimum distance to fall so that degradation is minimized. Incoming hopper wagons are positioned by capstans above chutes in a specially constructed bridge. The coal is discharged on to an under-rail tray and from that passes to a conveyor linking the unloading point with an adjoining building that contains 14 storage hoppers, each with a capacity of 14 tons. A subsidiary conveyor beneath the bridge can be employed for direct lorry-loading. Two of the storage hoppers discharge by chute direct into traders' lorries for bulk deliveries; the remaining 12 converge on to individual bagging and weighing points which are semi-automatic, eliminating dust and most of the physical labour inherent in traditional handling methods. The storage capacity is adequate to guarantee merchants supplies of all grades of coal "on tap", except perhaps in very bitter weather generating particularly heavy consumer demand.

The contractors for the coal plant were Charrold Ltd of London.

accident report

Derailment near Kettering LMR

IN his report into the derailment of a diesel multiple-unit train on December 10, 1963 between Glendon Junction and Kettering on the Midland main line from St. Pancras (*HMSO* 1*s*), Lt-Col. I. K. A. McNaughton finds that the accident was caused by one of the diesel engine and transmission assemblies on the leading coach becoming detached from the underframe and falling under the train. The train, the 10.02 Leicester–St. Pancras, was composed of six cars, a four-car suburban unit of two trailers and two motor coaches, each powered by two Rolls-Royce 238 b.h.p. diesel engines and hydraulic torque convertor transmissions, and a two-car gangwayed diesel mechanical unit at the rear. The train was travelling at about 60 m.p.h. near Glendon North Junction when the driver felt a bump followed by vibration; a driver under instruction was actually at the controls and applied the brake, but the train became derailed almost immediately. Fortunately casualties were light and only two passengers and four railwaymen were slightly injured or suffered from shock. The cause of the derailment was clear and there was no operating irregularity. A small fire caused by leaking fuel was quickly extinguished, but one fire extinguisher on the train was found to be empty.

Lt-Col. McNaughton's investigation concentrated on the engine and transmission assembly, which had become detached from the leading car, the method by which it had been attached to the underframe and the examinations of the car since its release to traffic from Derby works four days before the accident. Each power car of the four-car suburban unit involved in the accident had two horizontal engine/torque converter assemblies, each of which drove a single axle of one bogie. The engine/torque converter assembly was held in position by four brackets, two at the torque converter end and two at the non-driving end, which were bolted to the underframe by four bolts. From an examination of the car and the components found on the track approaching the point of derailment it was clear that the four bolts of the outer suspension bracket at the torque converter end of the No. 1 assembly, which drove the leading bogie, had worked loose over a period and dropped out some time previously.

The weight of the torque converter end was therefore being carried only by the inner bracket, thus causing excessive deflection of the Metalastik suspension insert between the upper and lower portion of the bracket and misalignment and overheating of the direct drive shaft, which eventually fractured. At the same time the overloaded bolts on the inner bracket failed and the torque converter end fell towards the track, bouncing along the sleepers and scattering its components. The engine-end suspension then failed and allowed the entire assembly to fall under the train to initiate the derailment.

Although the car was tested after overhaul at Derby works five days before the accident and was examined by a fitter on arrival at Cricklewood diesel depot, the loose bolts were not discovered. Lt-Col. McNaughton does not hold any of the examining staff responsible and observes that the tightness of the bolts should have been checked at Derby works. An examination of similar diesel cars revealed that several had suspension bolts missing or loose. While more stringent examination should prevent a recurrence in future, Lt-Col. McNaughton observes that the fault is basically one of design and recommends that the type of bolt employed and the form of locking should be reviewed. He draws attention to the layout of the underframe equipment on these cars and the inaccessibility of the engine and torque converter assembly, which is surrounded by batteries, radiators and other auxiliaries, making inspection difficult. Finally, he stresses the need to prevent the build-up of the oily dirt deposit, which constitutes a considerable fire risk.

Collision at Bradford Exchange

A head-on collision between a two-car diesel multiple-unit running out of control and a stationary parcels train at Bradford Exchange station on June 3 last was caused by the incapacity of the diesel train driver, who was taken ill as the train approached the terminus on a steep falling gradient, concludes Lt.-Col. J. R. H. Robertson, the inspecting officer in his report (*HMSO* 2*s*). The diesel train, the 16.25 from Manchester to Leeds, was composed of a two-car unit with both coaches powered; it should have stopped at Mill Lane Junction signals on the 1 in 50 falling gradient into Exchange station, since the Bradford signalman had not cleared the block instruments for the previous train. Instead, the diesel train ran on unchecked and had reached a speed of about 50 m.p.h. when it hit the engine of the parcels train. The leading coach was severely damaged and two passengers and the driver were killed and 16 passengers injured in the accident.

Evidence from passengers who had travelled in the leading coach and moved back when they saw a collision was imminent suggested that the driver had attempted a brake application approaching Bowling Junction one mile from the terminus, but had returned the brake handle to the release position. He then moved the brake handle several times between the release and apply positions in quick succession, but the applications did not have time to take effect and by this time the train was on the 1 in 50 gradient. Witnesses said the driver sounded the horn almost continuously from Mill Lane, but remained impassive and sat upright in his seat until the collision. A post-mortem on the driver revealed that he had a heart attack, presumably as the train got out of control.

In assessing the events leading to the accident Col. Robertson is satisfied that there was not a brake failure and that mismanagement of the brake alone did not cause the accident. He concludes that the heart attack was induced as the train travelled between Bowling Junction and Mill Lane, but its causes are a matter of speculation and it may have been brought on by mental shock in thinking that his train was out of control. His condition would account for his otherwise incredible action in releasing the brake and maintaining the driver's safety device in the master controller depressed, thus depriving himself the emergency brake feature, also in not warning the passengers of the situation.

Col. Robertson remarks that the accident arose from a number of coincidental factors. However, he lays some blame on the guard of the train for not keeping a lookout and for not applying the brake when he became aware of the emergency.

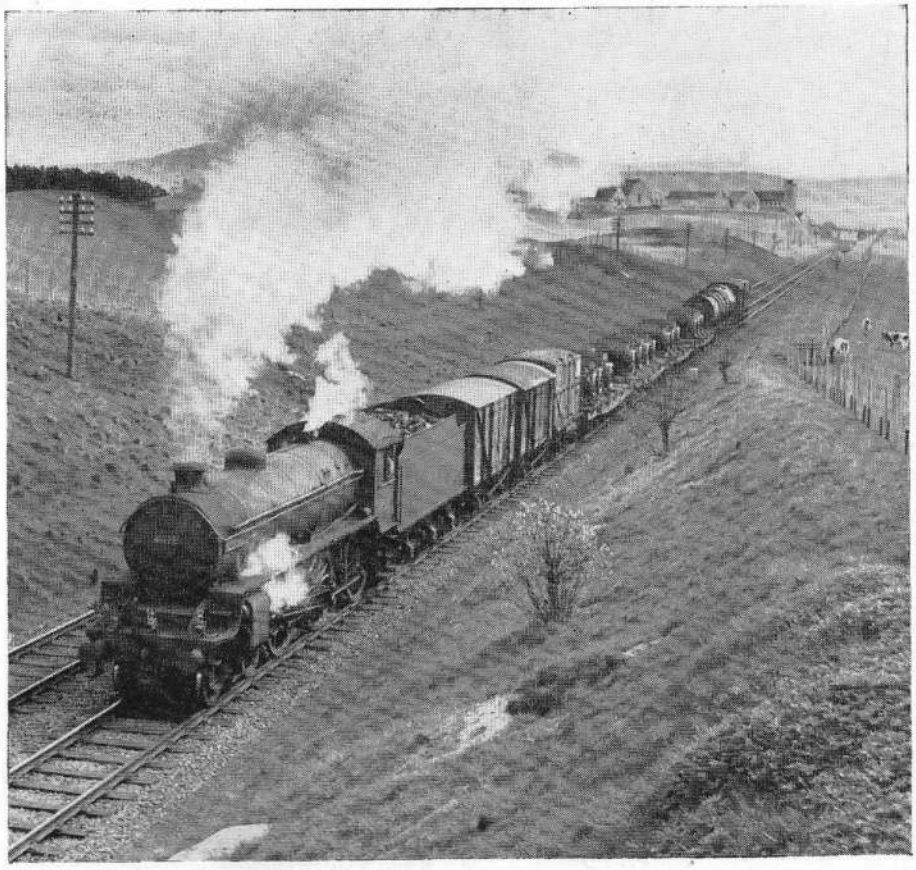
BRB's "TRUE COSTS" ATTACKED BY HOLDING COMPANY

THE BRB's report on the true costs of road and rail trunk freight services, presented as evidence to the Geddes Committee on road vehicle licensing last summer, came under fresh criticism at the beginning of December. Ironically, in view of the rumoured translation of Dr Beeching to a new transport overlordship, this latest blunt rebuttal comes from BR's one-time partners, the Transport Holding Co., which now operates the road passenger and freight vehicles formerly in BTC ownership. Its survey of road revenues and costs, also presented as evidence to the Geddes Committee, was described by Sir Philip Warter, its Chairman, as "an answer to what we consider wrong thinking which would damage our enterprise". It rejects the BRB calculation that £500,000 of every £700,000 spent on new motorways was debitable to the special requirements of heavy lorries and accepts the Ministry of Transport's assessment of about £124,000. Therefore, it says, the calculated road costs per vehicle-mile of 10-ton and 16-ton road lorries should be reduced by about one half, to 3.65d and 4.83d respectively. At this level they are less than the computed contributions for taxes etc. per mile, which are 4.0d and 5.2d respectively.

The Transport Holding Co.'s document goes on to attack the BRB's survey for unfairly overburdening heavy lorries with policing and other overhead costs which the BRB estimated at four and five times the amount debitable to private cars. Moreover, it says that the capacity of a new motorway and some of its other design elements are determined more by the requirements of the fast private car and of peak traffics than those of the commercial vehicle, which is slower and which operates in the off peak, often at night. According to the Transport Holding Co., the joint costs should be more fairly allocated in the ratio of vehicle miles. This would reduce the costs imputed to the heavy vehicle still further, to about 2.14d per mile for a 10-ton lorry and 2.71d for a 16-ton lorry. In other words, the Transport Holding Co.'s view is that the heavy lorry is paying double its fair share of costs already.

Like the Ministry of Transport's report on the same subject, the Transport Holding Company's survey rejects the restricted BRB view of the problem as concerning solely freight haulage over trunk routes and feels that the whole road system must be considered in any study of comparative costs. Overall, claims the Holding Company, roads were making a 40 per cent profit on their capital in 1962.

focus



Right: Class B1 4-6-0 No. 61029 heads away from Carstairs on the Edinburgh line near Carnwath with a freight from Carlisle Kingmoor on May 15, 1964.

Below: Class A3 4-6-2 No. 60085 *Manna* attacks the last two miles of the climb to Whitrope summit, north of Riccarton Junction, with a northbound Waverley route freight on September 26, 1964. *Photos by D. Cross, P. Riley*

FOCUS concluded

Left: Class 5 4-6-0s Nos. 44944 and 45494 meet on Shap Fell near Salterwath on August 1, 1964 with Glasgow–Morecambe empty stock and a northbound freight respectively.

Below: A down fitted freight restarts from Tebay after stopping to collect a 2-6-4T as banker on the evening of May 14, 1964. *Photos by D. Cross, M. S. Welch*

today and tomorrow

TWO MORE COMPUTERS FOR RAILWAYS

TWO new computer installations have been announced by the BRB with an indication that others will follow shortly. On the WR, a Honeywell H200 system is being set up at Reading. Requirements were submitted to five computer manufacturers in May, 1963 and after an intensive study it was decided that this US computer manufacturer's ideas for the creation of centralised electronic data processing bureaux conformed most closely to the BR concept. However, the Honeywell computer itself is to be built in Scotland. Of the three interlinked central processors it comprises, two will be working full time on information about wagon movements and wagon stock control, while the third will deal with various accounting, statistical and administrative needs. With this computer, the payroll for the WR's 55,000 employees will be completed in 12 hours, instead of 60 as at present. Other time-saving tasks which will be allocated to the Honeywell computer are the production of the weekly revenue figures within minutes of the closing of the accounts, instead of after three days' work as at present, and the production of staff statistics within minutes from a store of 24 essential facts about each employee, ranging from pay, tax, job, and years of service to age. At the nerve centre of the system in Reading, only about 11 people will control the computers on any of the three shifts planned for 24hr-a-day work. Many others of course, will be needed to feed in the facts, but numerous staff will be freed from the chores of administration for more important work. Staff redundancy will be reduced to a minimum, as the system is being introduced over a period of six to twelve months, which will allow manpower to be adjusted by normal promotion, retirements and wastage. An IBM 1410 computer to be installed at Darlington will be the first of its kind on BR. Its job will be chiefly the accounting and administrative work of the Board's superannuation and pensions funds, covering nearly 500,000 people as well as 200,000 Savings Bank accounts, which at present are dealt with at eight different centres. It is also to be used to process traffic surveys and for experimental work in connection with timetabling, locomotive diagramming and crew rostering. Later, it will undertake staff statistics and allied matters as part of its regular work. Darlington was selected as the location for the Centralised Accounting Unit and its IBM computer because a suitable office building was available and staff recruitment and housing did not present a special difficulty. The Centralised Accounting Unit will be controlled by BRB headquarters and will occupy one wing of Stooperdale offices, the other remaining as an accounting office of the NER. Both computers are expected to be in operation during 1965.

Management changes pinpoint responsibility

The theories underlying the reorganisation of management throughout BR were outlined by Mr. D. M. Dear, the Scottish Region's Finance Director, in a paper to Glasgow University's Department of Extra-Mural Education in November. The overriding aim, he said, was to clarify objectives, simplify the tasks of individuals and pinpoint responsibilities. At the level of local management, stationmasters, goods agents, yardmasters, motive power depot superintendents and the like were being impressed that their job was one of management and not merely of supervision or superintendence; in many cases their designation was being changed to emphasise this. Unnecessary intermediate layers of management were being eliminated and a three-tier structure was clearly taking shape—local unit, divisional management and general management. Districts were disappearing as a management level below divisions and the technical functions formerly exercised through a departmental organisation were being looked after by specialist officers on divisional and general management's staff. At divisional level, the traditional railway pattern of innumerable general assistants, assistants to and heads of sections was disappearing. In the middle range of management, new posts had been created with specific responsibilities, such as Cartage Manager, Terminals Manager, Sales Manager and Liner Trains Manager; this pattern was repeated at Regional management and at BRB levels. In other words, the new policy was to give each man a specific job rather than have a number of men encompassing between them a number of jobs over which none of them had complete responsibility. Important transfers of responsibility had been made in connection with maintenance and repair work. In one form or another, this absorbed £160m a year, or about 30 per cent of total BR expenditure. It was therefore of supreme importance to keep this under strict control. Of the two factors governing it, the extent of the maintenance work required and the efficiency with which it was carried out remained the responsibility of engineers. But the more important decision as to the quantum of assets to be maintained had been placed firmly on the shoulders of the assets' users.

Assessing the operational costs

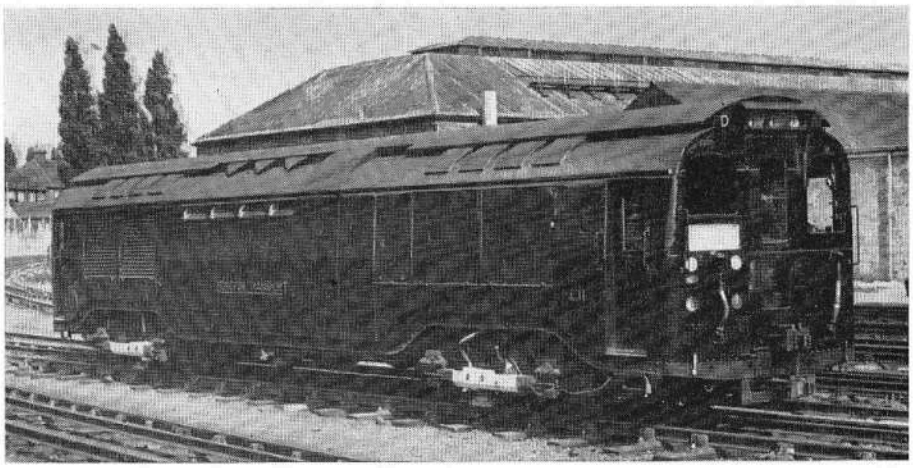
To help the men charged with these new and clearly defined responsibilities, said Mr. Dear, a great deal of effort is being devoted to the evolution of some sophisticated but simple-to-use index of performance. For the most part, the wealth of statistical and financial information the railways have maintained concerning their activities has been merely figures of record that could not be clearly related to particular responsibilities or used as a basis for decision-making. The new kind of management information, which is designed to satisfy the needs at different levels, will bring out clearly the cost of specific operations and provide a comparison in terms of unit cost and various measures of utilisation with acceptable standards of performance. In the overhaul of financial and statistical data, methods of compilation are naturally scrutinised. A high degree of accuracy is seldom essential and for the purpose of remedial action the information must be made available quickly. A great deal of dreary clerical work, therefore, is being eliminated by the use of probability sampling and similar techniques. Forthcoming computer applications will be of great assistance. The emergence of clear objectives and the advent of much-needed new equipment, said Mr. Dear, was already having a tonic effect; so was the substantial financial improvement already achieved. Greater benefits still would flow from better internal communications and the changed concepts of management which would make clear to all staff the part they had to play and the personal influence on ultimate success which was now theirs. Mr. Dear stressed as very important the fact that, in all the procedural changes which were being made, management was working on a basis of trust rather than mistrust. This not only facilitated the sweeping away of a mass of checking and double-ckecking routines; it also underlined the greater responsibilities which were being placed on BR staff.

Cheap day muddle cleared up

As soon as the Transport Tribunal had begun its public enquiry into the BRB's latest application for a London area fare increase, the BRB clarified the harmful obscurity of the first press reports to which MODERN RAILWAYS drew attention last month. Apparently protocol requires the BRB not to comment on an application to the Tribunal until its hearings begin; the confusion may therefore have arisen from garbled reports of the application when it appeared on the Tribunal files. Unfortunately, according to reports reaching us, even stationmasters at some towns up to 80 miles from London believed for a few weeks that all their cheap day tickets were to be abolished; at one Kent Coast town, at least, a large number of people making regular London trips on cheap day tickets had already begun to form groups to share motoring expenses and driving chores because the local station confirmed their fears. The BRB now stresses that it is seeking a 5 per cent rise in season ticket rates only within an 80-mile radius of London, an increase in some sub-standard LTS line fares and the abolition of the statutory day return ticket, available at all times, within the statutory London Area, which is of about 20-30 miles' radius. Even within this area, cheap off-peak facilities are to be improved; elsewhere "special attention" is being paid to the development and promotion of cheap day and excursion tickets. In the BRB evidence to the Transport Tribunal it was pointed out that in two years BR have already exhausted £250m of their five-year Treasury grant of £450m to meet deficits.

An ER outlook on freight

Customer trains appear to be the field in which BR are nearest to getting the best



London Transport's new Acton Works shunter, No. L11. It has been fashioned out of two 1931 tube motor-cars, cut approximately in halves and joined back to back. On the Acton works duty it is supplementing No. L10, built from two 1903 motor-cars. In both cases the locomotives were produced at Acton works. No. L11 retains the standard BTH 1931 tube stock control equipment but has had its electro-pneumatic brake removed and is now equipped with Westinghouse braking only. The majority of the air piping, the main and auxiliary reservoirs and the triple valves have been raised from below the frame and installed in the former passenger compartment. At one end, seen here, No. L11 has two sets of drawgear, one to couple to tube cars and the other to LT surface stock.

they can out of the freight market and properly covering costs, including contributions to overheads, Mr. J. Hancock, Assistant General Manager (Commercial) of the ER, told a Sheffield conference of the Institute of Transport in November. Where traffic offers with sufficient regularity and in sufficient quantity, and furthermore, if it is at such a rate that it could keep a diesel locomotive fully employed throughout its working week, then BR can in many cases beat road competitors on rates and service. In some cases BR can even match coastal shipping on price. The difference between the Liner train and the customer train is that in the former case BR will have to quote prices which are marketable for varying customers. The BRB is carefully studying the charges structure which might become the basis of Liner train charging. The cost structure on rail is being examined against the relative cost structure by road and related to the sort of price that will be attractive to road hauliers, yet will properly cover rail terminals and haulage costs. Ordinary wagonload traffic must continue to play a very important part of BR business, since it is the nearest unit of business to the lorryload, and therefore BR are examining the future pattern of freight train working in relation to wagonload business. Because of marshalling and trip working of wagonloads into centres to make up trainloads, typical costs for this business are inevitably higher than they are for a wagon which makes up part of a pre-planned trainload. It may be, said Mr. Hancock, that BR need to increase charges to cover this and they might even be prepared to sacrifice some traffic rather than continue to charge it on a historical basis. Where wagonload traffic presents itself in quantities of 6 or 10 a day, some specialised bargaining in between the trainload and wagonload concept is often necessary. In this field too, there is a lot of specialisation in types of wagon; wherever possible, BR encourage customers to own the wagons or the equipment and simply quote haulage rates to them. The ER, in a recent re-organisation, has done away with the old conception of a rates office and a development office, and put its freight staff into six groups: (1) iron, steel and engineering; (2) agriculture, foodstuffs and market traffic; (3) oils, chemicals, motors, plastics, textiles; (4) building materials and miscellaneous full loads; (5) sundries by freight train and parcels by passenger train, including fish; and (6) special projects. These groups operate under a freight sales manager, who is supported by the freight rates manager and the freight development officer. It is hoped that the group teams will develop within their own fields a lively sense of competitive urgency. They will advise Divisional managers and help them in all the more important negotiations for business.

The new charges for sundries

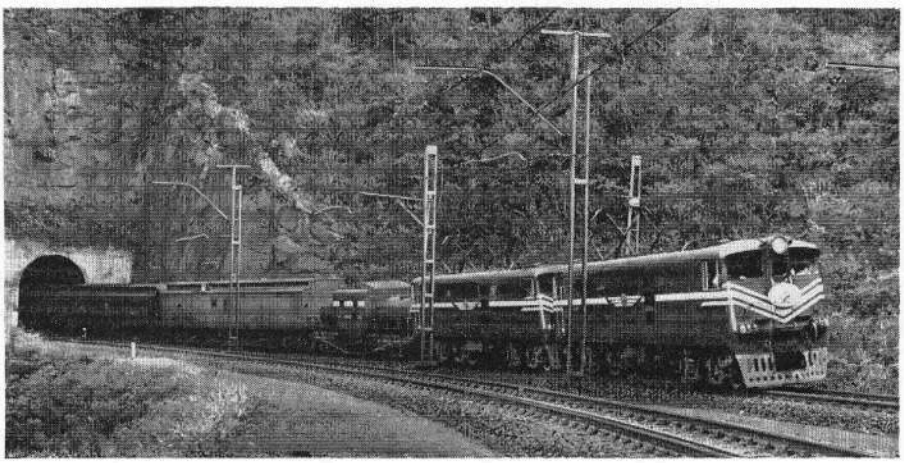
The history of sundries traffic has been tied to charges scales, said Mr. Hancock. In August, 1964 a new system of charging for sundries traffic was promulgated. Because it is dealing with all the implications of the small unit, it is still, in principle, a collection of scales, but it has taken a step forward in trying to relate the scale of charges to the routes—in the widest commercial sense of the word rather than in a strict historical railway sense—over which the traffic has to travel. After all, road transport had been quite selective in this business. There are certain routes between main centres where regular business is flowing in both directions with many return load rates and where road haulage has been most active. On the other hand, where the odd hundredweight simply has to go between two relatively remote places, often involving much transhipment and handling, no one seems to be particularly anxious to have the business. The charge for such flows of traffic is clearly on a much higher basis than it would be between London and Leeds. Certain rebates and concessions can be given within this new structure, but they are specific concessions for working arrangements with traders. Operation has also been rationalised, reducing considerably the number of transhipment points.

New SR cross-country services?

The SR is studying possible development of two orbital passenger services in the re-shaping of its timetables. The idea has been stimulated by the recent restrictions on inner London area office building, which might in time set up commuter flows across country to new commercial concentrations outside the Greater London limits. Close contact is being maintained with local authorities in the formulation of these plans. One of the routes under study extends from Chatham via Maidstone, Tonbridge, East Grinstead, Crawley, Horsham, Guildford and Basingstoke to Reading. The other is a coastal route from Bournemouth to Ashford via Southampton, Portsmouth, Brighton, Eastbourne and Hastings. An important change of fortunes for two lines is implied by this scheme; the Ashford–Hastings branch was earmarked for closure by the Re-Shaping Plan and the Reading–Tonbridge line for modification of its passenger services. The latter line is having its steam services replaced by diesel-electric m.us. and locomotive-hauled trains from January 4.

New SR–NER freight service

A new fast freight service for Sussex and Surrey firms with customers in the North-East of England was introduced in November. Named the "North East Trader", it gives a direct weekday service from Brighton,



A £4m order has been received by AEI and English Electric for electrical equipment for 100 2,200 h.p. electric locomotives for South African Railways. The picture shows two locomotives of this type (Class 5E1) heading the "Trans-Natal Express" on the Natal section of the South African Railways main line from Johannesburg to Durban.

Crawley and Croydon to 15 industrial centres in the North-East, including Leeds, Sheffield, Hull, Newcastle and Middlesbrough. Traders using this train can load their goods at Brighton and Crawley up to 12 noon and at East Croydon up to 13.00. Wagons are run throughout to each of the 15 destinations.

Scots reorganise in Highlands

The Northern Division of the Scottish Division is being reorganised. Mr. Bernard Allison, Management Services Officer at the Region's Glasgow headquarters, has been appointed Manager, Highland Lines, based at Inverness, where he has been acting as Manager since September. From January 1 Mr. Allison will be in charge of all aspects of railways—from passenger trains to signalling—in an area extending from Kyle of Lochalsh in the west to Inveramsay in the east and from Stanley Junction in the south to Wick and Thurso in the north. The all-embracing nature of this appointment is a new concept in BR management.

Cheap day to the far North

A surprising Scottish Region innovation is the introduction of cheap-day returns from Inverness, Dingwall, Invergordon, Tain, Golspie, Brora and Helmsdale to Wick and Thurso. With one of these tickets a second-class journey from Inverness to Wick and Thurso, 161 miles each way, can be made for £2 5s 0d return, compared with a normal return fare of £4 0s 6d; the economy possible ranges from £1 15s 6d in this case down to £1 4s 0d on a return journey from Tain. (In announcing this concession, the Scottish Region reported that passenger carryings between Edinburgh and Glasgow have risen by 30 per cent since the introduction of cheap single tickets at 6s 6d second class and 10s first class, between these two cities three months ago.) Elsewhere in the north, stopping passenger services between Keith Junction and Elgin via Mulben and between Aberdeen and Inverurie were withdrawn on December 7.

Car-sleeper from Leeds

Reporting that their car-sleeper trains last summer carried 2,224 cars and 6,050 passengers, the NER announced a new service from Leeds for 1965. This summer its three car-sleeper services will run to Newhaven and Dieppe from Newcastle and Leeds (not York as in previous years); to Inverness from York and Newcastle; and to Exeter from Newcastle and Sheffield. The South Coast and Continental train, with accommodation for 24 cars and 88 sleeping berths, will run from Newcastle and Leeds to Newhaven Harbour on Wednesdays from June 2 to September 15; return services will run on Thursdays from June 3 to September 16. The Highland train, with accommodation for 30 cars and 90 sleeping berths, will run from York and Newcastle to Inverness on Fridays between April 30 and October 1, Sundays May 16 to September 19, and Wednesdays June 2 and July 21 to August 25. Return services from Inverness will run on Saturdays, Mondays and Thursdays during the same periods. The West Country train, with accommodation for 26 cars and 96 sleeping berths, will run from Newcastle and Sheffield to Exeter on Fridays from April 30 to October 1 and on Sundays from May 30 to September 19. Return services will be on Saturdays and Mondays.

BR standard parcels trolley

The compact parcels trolleys recently introduced on the WR are to be used throughout BR. An extra 2,000 have been ordered to join 2,500 already in use, mainly in the WR. Code-named "Brute"—short for British Railways Universal Trolley Equipment—each trolley can carry a ton within its proportions of 5ft 8in by 3ft 6in by 5ft 6in. Fully loaded and in spite of its own weight of 460 lb, a Brute can nevertheless be manoeuvred quite easily because it has polyurethane tyred wheels running on taper bearings that are sealed for life. It is coupled automatically to other Brutes and a hand-brake positioned within easy reach affords a means of control while the trolley is being manually propelled on platforms. One of its outstanding advantages is that it can be forklifted into a parcels van, so that transhipment of its load is avoided. The initial experiment with Brutes on parcels post traffic between Paddington and Bristol led to improvements in design. Brutes are presently available in two basic forms—open, or with flexible and removable nylon side panels—but firms are already asking BR to design variations for their own particular use.

Car traffic from Kings Norton

BR traffic in new cars from the West Midlands railhead at Kings Norton is developing steadily. The goods yard there has now been altered to provide capacity for 1,000 cars, so that bigger car trains can be made up, and further developments envisaged will allow 2,000 cars a week to be handled. As briefly reported last month, the latest development in train services from Kings Norton is a thrice-weekly car-carrier, running at 14.25 on Tuesdays, Thursdays and Saturdays to Bathgate, Scotland. This is carrying close on 300 BMC cars weekly, which reach Bathgate the following morning and are immediately offloaded for road delivery to retailers throughout Scotland; the cars are ferried from the Longbridge factory to Kings Norton by BRS transporters. The train-set, which operates in circuit between Kings Norton and Bathgate, comprises 20 60-ft long car flats. It returns from Bathgate at midday on the day of arrival and regains Kings Norton the same night; in this direction it will bring back a growing traffic of commercial vehicles from Scotland.

Lincoln–Nottingham service reprieved

The ER has announced that, following an appraisal of the economic position, the Lincoln St. Marks–Nottingham Midland passenger service is to be retained until further notice. In the near future, however, the service is to be modified; the changes will affect principally the off-peak services. In connection with its proposal to close the Lincoln–Grantham service and shut eight stations between Lincoln and Cleethorpes, to which objections were recently heard by the East Midlands TUCC, the ER has claimed that the journey between Lincoln and King's Cross will take only 4min longer via the projected new spur at Newark (of which the earthworks have now been begun), as compared with the present time via Grantham. On the other hand, the additional mileage will mean an increase of 1s 3d in the single fare. The spur between the Grantham–Nottingham Victoria line at Netherfield & Colwick and the Lincoln–Nottingham Midland line (*September* 1964 *issue, page* 202) is complete but was not in use up to the end of November, writes L. A. Pickering. In connection with this spur, colour-light signalling has been installed on the Lincoln line in the down direction from a point west of the new junction to west of Carlton & Netherfield station, and in the up direction, from west of Burton Joyce station to west of the junction.

Bristol suburban changes

Following withdrawal on November 23 of the Bristol "loop" trains to Avonmouth and Severn Beach via Henbury and Pilning, the remaining suburban service, Bristol–

NEWS IN BRIEF

At the beginning of this winter's timetable all non-stop trains between Leeds and Huddersfield previously using the Spen Valley line via Heckmondwike were re-routed via Dewsbury, with the exception of the 17.05 Liverpool Lime Street–Newcastle, which was doubtless left untouched for legal reasons; however, in compliance with the Transport Act, 1962, which requires it even though all intermediate stations between Spen Valley and Farnley Junctions have long been closed, the NER has recently issued large public notices intimating that "the train now travelling . . . via Heckmondwike . . . will be diverted via Dewsbury" from January 4, with the usual provisos about objections.

Reduced fare long-distance week-end tickets, first introduced experimentally in the NER in October last year, have proved so popular that they are to be continued indefinitely; nearly a quarter of a million week-end tickets were sold during the first nine months of 1964.

The LMR's first coal concentration depot in the North-West is in operation at Birkenhead North; the depot has been built by the Birkenhead Co-operative Society and will take about 85,000 tons of coal annually in three block trains a week from Staffordshire collieries, together with other supplies by ordinary services from North Wales pits.

The LMR carried out a fortnight's survey of passenger traffic on the Midland Lines in November.

The WR has opened its second automatically-controlled station car park at Exeter St Davids.

Stopping trains between Swindon and Didcot were discontinued on December 7 and five stations and a halt closed to passenger traffic.

Mr. J. E. Brenan, British-born but an officer of the Canadian National Railways for the past nine years, has been appointed Assistant General Manager (Finance) of the ER.

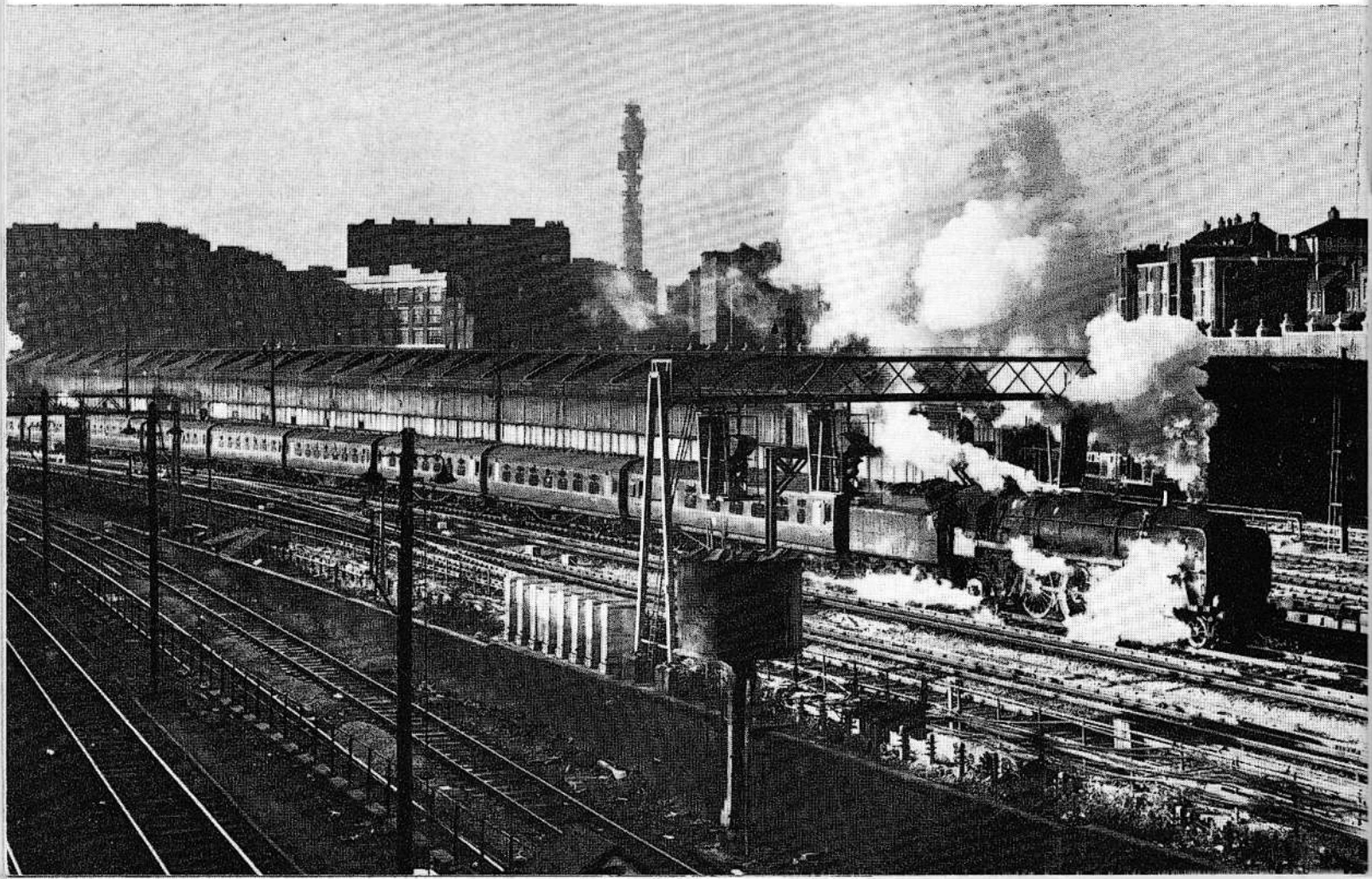
Mr. David Bowick has been appointed an Assistant General Manager of the LMR; he has lately been Planning Officer at the BRB, and before that District Operating Superintendent, Lincoln until March, 1962, when he became GN Line Movements Superintendent.

Mr. Claude Hankins, formerly Plymouth Divisional Movements Manager, has succeeded Mr. F. D. Pattisson as the WR's Plymouth Division Manager.

In succession to Mr. G. Lambert, who retired at the end of 1964, the LMR has appointed as Line Manager, Manchester Mr. T. R. Barron, a former LNER man who has lately been Assistant Line Manager.

A convoy of "Brutes"—British Railways Universal Trolly Equipment—at Paddington. This pattern of trolley is being adopted by all Regions of BR (*see this page*).

Last days of steam south of Crewe, where it is banned from the start of 1965 on through traffic. **Above:** Class 7P 4-6-0 No. 46160 on the down through line in Crewe station after arrival with a Euston–Glasgow relief on July 31. **Below:** "Britannia" class Pacific No. 70044 *Earl Haig* climbs Camden Bank with the 8.5 Euston–Holyhead on August 31, 1964. *Photos by M. S. Welch, B. Stephenson*



Clifton Down–Avonmouth–Severn Beach, has been given a revised timetable. It had been hoped to operate the line with only two diesel units, shuttling to and fro throughout the day, but although the new timetable was a general improvement over the previous service, some timings proved inconvenient to commuters. The position was eased by the addition of a third unit in the morning rush-hour, but a campaign was continued by firms whose employees were affected to obtain further alterations, including an additional evening working, and fresh alterations were made before the starting date of November 23. Press publicity for the revisions announced extra trains between 10.00 and 16.00 for shoppers, but in fact there are only two additional trips—one leaving Bristol TM at 09.00, the other at 11.00. As two evening services have been abolished the total number of workings remains the same as before. Local railway staff see these changes as the first step to a "bus stop" service of unstaffed intermediate stations and conductor-guards. This was originally suggested last spring, when plans for closure were turned down, but it is understood staff difficulties have so far prevented the plan being put into operation. Elsewhere in the West Country, strawberry growers in the Cheddar Valley have been told that the WR cannot reopen the now closed branch for their traffic in the season; they have been invited to use the railhead at Yatton instead.

WR suburban service in trouble

The WR's London suburban service, extensively recast this winter (*see October issue*), has run a gauntlet of criticism. Some suburbs protested strongly at loss of evening trains and peak-hour calls by others involved in the redistribution of stops, and following amendments to meet these attacks punctuality seems to have been seriously affected. From December 7 further changes were made. Four up and two down peak-hour trains have had their accommodation increased. From the same date a late night rail service was restored between Paddington and the Henley-on-Thames branch; on weekdays the 22.30 Paddington–Penzance night express calls specially at Twyford at 23.03, where a connection is provided for stations on the Henley branch. By implication the London Divisional Manager, Mr. F. O. Pattisson, put some of the blame for deficiencies in the service on track relaying work, which has been going on for some weeks. Announcing the fresh timetable changes, he told the local press that of the 36 miles of the down main line between Paddington and Reading, 28 had now been relaid with continuous welded rail. Work would continue during December on some of the final sections, involving a rather long stretch at Southall, and a very much shorter one at Slough. At Reading itself extensive work on the main junctions at the western end of the station would be taking place during the first half of December and in the week before Christmas nearly a mile of the up main line between Theale and Reading West would be relaid with continuous welded rail.

Peterborough East closure proposed

The closure of Peterborough East station is now officially proposed. At the same time, all passenger trains would be withdrawn from the Peterborough–Rugby line and from the Seaton–Stamford branch, while local train services between Peterborough and Leicester London Road would be abandoned. As a substitute a passenger service between Peterborough North and Leicester via Stamford, Oakham and Melton Mowbray is planned; the Birmingham–Ely and Lowestoft–Birmingham trains would be re-routed via Leicester. Notices have also been posted for the closure of Gretton, Corby and Old Dalby stations on the Nottingham–Kettering line, but these include a reassurance that through expresses will not be affected.

Fawley–Hitchin gas by rail

A new traffic has begun from the Esso refinery at Fawley, SR to Hitchin, ER. At Cadwell, north of Hitchin, the Eastern Gas Board has set up a plant to reform light petroleum naphtha to a gas that will enrich methane which is now being imported from the Sahara and piped from Canvey Island to eight Area Gas Boards throughout the country, in order to obtain a product with the combustion characteristics of coal gas. The plant at Cadwell is rail-connected and trainloads of virgin naphtha feedstock have begun to run from the Esso refinery at Fawley. Each is made up of 22 tank wagons and when the plant is working at its full output there will be a daily service.

Cardiff "Night Trader" begins

Following the introduction of Bristol and Chiltern "Night Trader" freights earlier this year, the WR began on November 16 a Cardiff–London "Night Trader". This is a high-speed service for full-load merchandise which operates nightly in both directions from Mondays to Fridays. It offers guaranteed early morning delivery at competitive rates, and vans and container-space can be booked in advance. Diesel-hauled, the "Night Trader" leaves both Paddington and Cardiff before midnight.

NCB traffic at Coalville

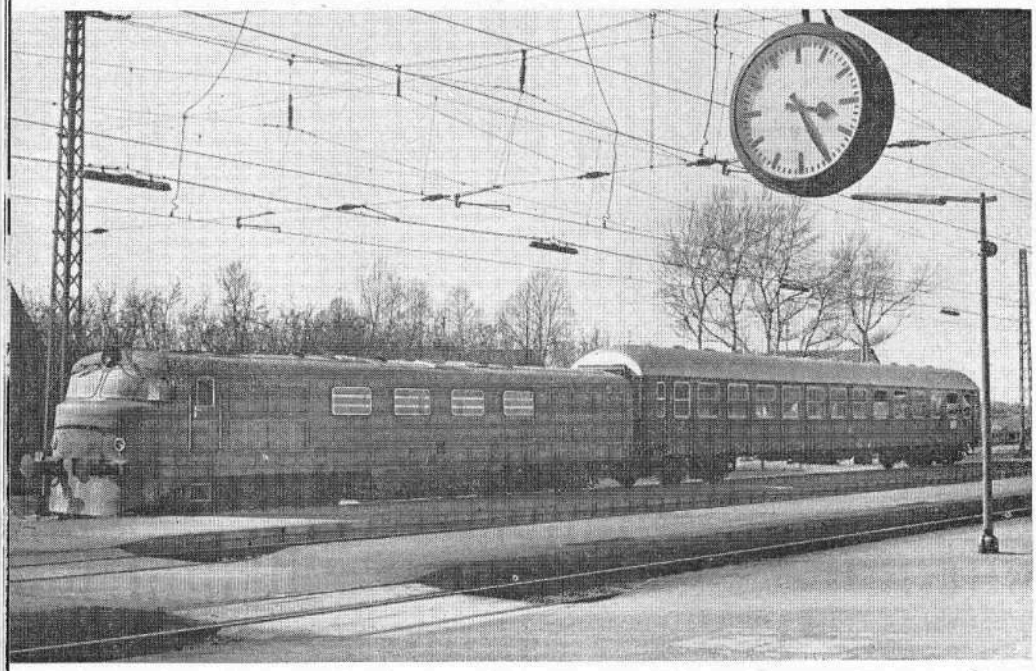
The NCB has recently constructed a £4½m drift washing and screening plant at the rear of Snibstone Unit, Coalville. The completion of this plant has enabled concentration of the output of Whitwick and Snibstone units, while the ultimate aim is to deliver a large proportion of coal mined in neighbouring collieries underground to the plant, where it will be elevated to ground level for washing and screening. Much of the coal mined is industrial grade and used by the CEGB at such power stations as Castle Donington, Drakelow and Hamshall, so that these developments are of considerable interest to BR, writes R. B. Pounds. But at present BR operations in this connection have several handicaps. The evening and overnight trains of empty wagons to Coalville No. 1 sidings for delivery mainly to the new screening unit, though some go to nearby Whitwick colliery, where trains are still loaded, mean constant occupation of the level crossing on the A50 road. Moreover, movement of wagons to and from the Snibstone Unit by the NCB's own diesel 0-6-0s involves the crossing of another busy road, the B585, to Market Bosworth. These crossings, both in the centre of Coalville, already carry very heavy traffic and the recent opening of the M1 extension to Markfield, some 5 miles south-west of the town, will undoubtedly increase business on the A50. The existing BR gated crossing is scheduled to be replaced by automatic lifting barrier, but no date for the change can yet be ascertained. The BR trains have been worked mainly by steam locomotives from Coalville shed, but at the beginning of November, BR/Sulzer Type 2 diesel No. D5289 arrived for crew training at Coalville. Its use is presently confined to coal trains between Wellingborough and Coalville. In mid-November also a diesel 0-6-0 shunter, No. 12060, arrived for yard duty at Mantle Lane. Refuelling is at present done at Leicester, as no facilities are available yet at Coalville. Coal wagons from the Snibstone unit are normally taken to Mantle Lane Yard for sorting and despatched from there to the power stations mentioned.

LT's new axle-tester

A specially-adapted magnetic flaw-detection apparatus has been in successful operation for some months at London Transport's Acton railway works. It is used for detailed examination of axles and other railway car components and was manufactured by Solus-Schall, part of the Rank Organisation. The equipment, which functions on the well-tried principle of showing up the lines of faults by means of patterns formed by metallic particles, replaces similar apparatus in use at Acton for more than 30 years. With the older magnetic apparatus it was not easy to examine flaws occurring near the centre of the axle, because of a considerable weakening of field strength away from the contact heads. Investigations had been carried out for some time to find a more efficient replacement. The decision to adopt the Solus-Schall equipment was influenced by the fact that this firm manufactures as a standard product apparatus capable of testing pinions, brake rods, tripcock levers and other railway car components with a bed of sufficient length to make it adaptable for testing axles. This enables the machine to be much more fully employed than if it were confined to axle testing. The axle to be inspected is lifted by overhead crane on to detachable motor-driven rollers mounted at each end of the bed of the equipment. These rollers can be moved along the bed as required. The axle is then sprayed under air pressure with a fluorescent ink, which contains magnetic particles. When electrified, these take up a pattern along the line of fault and show its extent clearly when examined under an ultra-violet lamp. When the axle or other article to be tested is in position a current is passed through it by means of contact plates, to detect longitudinal fractures. If transverse fractures are suspected a 21in diameter coil is passed over the article being tested. For maximum efficiency it is desirable that the magnetic lines of force are at right-angles to the fracture; hence the electrical current flow should, as far as possible, be parallel to the fracture. By progressively reducing the field from high to low strength in small and regular steps the machine can be made to demagnetise automatically any article which has been tested. The procedure for testing small parts is basically the same as for axles. They can either be inserted in the coil, clamped directly between the heads or, if there are several articles with a fairly large hole in them, they can be suspended on a rod clamped against the contact plates. The process is then the same as for the axles, except that the smaller equipment is rotated by hand.

A CNR rail-rover ticket

To stimulate rail travel in Canada by European visitors, CNR have introduced the Canrailpass. The first facility of its kind in North America, it will give travellers from Great Britain, Ireland and continental Europe unlimited travel in Canada for a period of 30 consecutive days on all CN-operated trains. For adults the Canrailpass will cost $99 (£33) and for children between 5 and 12 $50 (£16 13s 4d). The pass will cover rail transportation only, but holders may purchase sleeping or parlour car accommodation in Canada if required. As in CN's Red-White-and-Blue fare plan, parlour or sleeping car space held by Canrailpass holders will entitle them to complimentary meals on trains providing these services. The ticket will be available through CN's own offices in Great Britain, also in Paris and Antwerp, as well as CN's general sales agencies throughout continental Europe. It will also be on sale through all authorised travel agents.



beyond the Channel

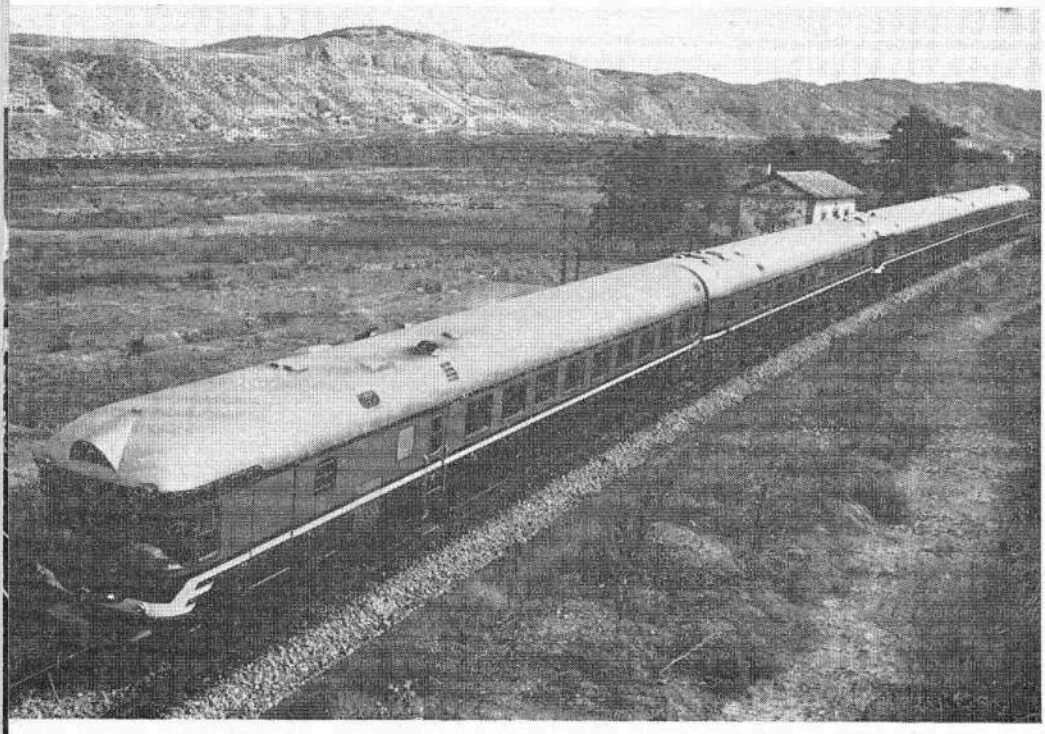
Edited by Paul Drew

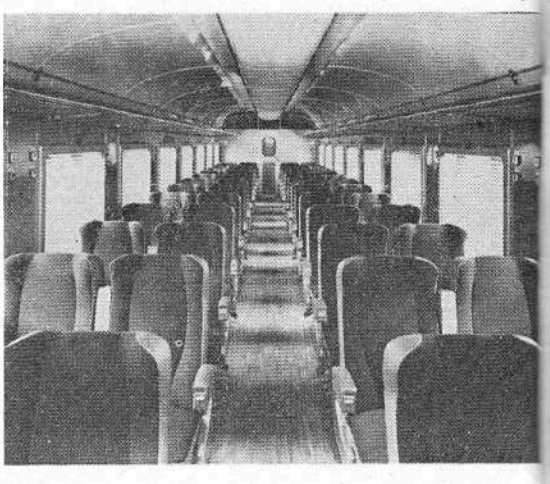
SPAIN

New Talgo diesel-hydraulics

THE new Talgo lightweight trains of RENFE, introduced in August on accelerated timings (*see October issue, page* 286, *and December issue, page* 433) are powered by five single-ended B-B diesel-hydraulic locomotives designed and built by Krauss-Maffei. Another five are now under construction at the Bilbao works of the Soc. Babcock y Wilcox under K-M licence. Because the specification required the locomotive contour to match that of the single-axle Talgo units forming the train, difficult design problems were encountered, in particular through the limitation of height to 10ft 9in and the restriction of the number of axles to four in conjunction with an 18.2-ton axle load. Moreover, the locomotive had to carry a sizeable auxiliary plant. Within these terms and a length of 57ft 3in over buffers, it nevertheless proved possible to install 2,400 h.p. traction power and also 500 h.p. auxiliary diesel-generator sets to provide for the air-conditioning, lighting and kitchen needs of the train itself, which is normally of 10 to 14 Talgo units. The traction power comes from two Maybach MD engines of 1,200 h.p. apiece at 1,500 r.p.m. and the auxiliary power from two Daimler 250 h.p. engines driving 175 kVA three-phase generators.

Each main engine drives a Mekydro four-stage hydraulic transmission, from the output end of which cardan shafts lead to the two axles of the adjacent bogie. Regulation of engine and transmission output is by a single controller in the cab, actuating a 16-notch control system. The maximum designed speed is 87 m.p.h. and the change-over points of the transmission stages are at 18½, 28 and 46 m.p.h. Starting tractive effort is 54,000 lb., and continuous rated drawbar





Top of page: A Krauss-Maffei 2,500 h.p. diesel-hydraulic for RENFE Talgo service, seen coupled to a standard-size DB coach, and one of the locomotive's bogies in close up.

Left: Exterior and first-class saloon interior of one of RENFE's 30 new four-car TAR diesel multiple-units.

pull is 46,000 lb at 12 m.p.h. Wheel diameter had to be kept down to 3ft 1½in because of the low floor level; bogie wheelbase is 10ft 6in and bogie pivot pitch 30ft 10in. The power/weight ratio on the basis of 74 tons weight when carrying two-thirds of the 800 gal of fuel is 39.2 h.p./ton, or 56 lb/h.p., which is among the best values yet attained in diesel locomotives, apart from the two French 4,000 h.p. diesel-hydraulics.

In construction and components the design is based on that of the German Federal Railway's V200 locomotives, with the principal difference that a driving cab is provided at one end only. The K-M bogies are of the same type as found in the V200 and BR "Warship" classes, but they have Knorr disc brakes with double discs attached to each wheel and with a separate brake cylinder for each wheel. The Knorr KE distributor is standard with those on the Talgo train units, and so is of aluminium construction. From the two auxiliary generators which provide the three-phase current for the train services, three-phase current is also drawn and passed through selenium rectifiers to give d.c. for various locomotive services, such as lighting, engine starting, cab heating and battery charging.

The winter schedules of the accelerated Madrid–Irun/Hendaye Talgo services with the latest stock (*see the December issue*) were finally fixed at 7hr 29min from Madrid Norte to Irun, 7hr 35min from Madrid to Hendaye and at 7hr 35min from Hendaye to Madrid. There are, as before, seven intermediate stops.

High-speed diesel trains

Thirty 1,700 h.p. four-car diesel train sets in course of delivery to the RENFE are being supplied by FIAT, CAF (Cia Auxiliar de Ferrocarriles) and MMC (Material Movil y Construcciones). Each consists of two motor-cars and two trailers. Three sets can be coupled up into a 12-car formation. The power unit is a FIAT-OM 850 h.p. Type SEH-L engine with FIAT-OM hydraulic transmission, and there is a separate diesel-generator set for the air-conditioning equipment. The total weight of a set is 190 tons and maximum speed is 75 m.p.h. There are 112 first- and 144 second-class seats in each set, conforming with the new RENFE policy of including both the upper classes in Talgo and other high-speed diesel trains, and also a kitchen-bar. One of the trains has been running for some weeks between Madrid and Santander and Gijon.

Two passenger classes from 1967

The RENFE is to conform with the standard European practice (adopted by most administrations in 1956 and more recently by the Portuguese Railways) of two classes instead of three. The change is planned for 1967. Thereafter first- and second-class fares are to be intermediate between the present first and second, and second and third class respectively, i.e. 1.7d and 1.1d a mile, against the present rates of 1.8d, 1.5d and 1.0d per mile.

BELGIUM

New rail layout for Antwerp

Construction of a new tunnel or group of tunnels under the Scheldt at Antwerp upstream of the existing road and pedestrian tunnels is associated with plans for radical alteration of the railway layout. The new tunnels are planned to comprise a double-track "bore" for an electrified railway (but construction will probably be by lowering prefabricated tubular sections of tunnel into a trench in the river bed) and two dual-carriageway road bores. Eastbound trains will enter the tunnel by a connecting line from the present Ghent via St. Niklaas to Antwerp Linkeroever ("Left-bank") line, which carries little freight traffic. From the eastern portal they will traverse a new electrified line without level crossings and probably below street level, round the perimeter on the south side of the city on the site of the old fortifications, to a junction at or near Berchem with the main line from Brussels to Antwerp Central passenger terminus and with the line leading round the east of the city via Antwerp Oost (served by the expresses to and from Holland) to the docks downstream of the city and to the Dutch frontier at Essen/Roosendaal. Linkeroever station is to be closed. Near the present Antwerp Zuid passenger terminus, which also is to close, there is to be a connection with the new line through the tunnel and with the docks upstream. The present freight connecting line from this area to the main line will be abandoned, since its many level crossings obstruct road traffic and hinder urban development. The result will be an electrified relief route for freight trains from Ghent via St. Niklaas to the docks east of the Scheldt and to the city freight depots, also a local passenger service from the left-bank area, which is being developed, to Antwerp Central and/or the Antwerp Oost line. A further project is the extension of the line northwards from the Central terminus to rejoin the Oost line near the present Dam station. This plan is designed largely to facilitate reconstruction to ease road traffic congestion. The Central station would be rebuilt. The present approach to it from the south, on a viaduct, and the extension northwards would probably be in tunnel. One result would be the routing via Central of the Brussels–Holland passenger services.

TV at Brussels Central

Excessive station time spent by trains at Brussels Central, the principal intermediate station on the Junction Line between Brussels Nord and Midi, has been found due almost entirely to difficulty in communication between station staff, guards and motormen along its curved platforms, which are below ground level. Study showed that the entrainment and detrainment of passengers occupied only half the time spent at stops. Successful operation of a pilot closed-circuit TV installation to overcome the difficulty has led the SNCB to install permanent TV equipment. TEE and other major international expresses do not call at Brussels Central, where most traffic is short-distance; peak-hour increases in this have called for shorter headways, which only shorter station times can make possible. All six tracks of the Junction Line are served by platforms and line occupation is intensive during the morning and evening peaks.

Brussels airport connection

The short single-track branch serving Brussels National Airport is now reported to be carrying between Melsbroek and Brussels Central over 40 per cent of the passengers who use the airport, although buses are used to convey into the city passengers arriving in the late evening and at night, when there is much less street traffic. The rail trip by diesel unit takes 16min. At Melsbroek, there are two rail platforms in the basement of the airport buildings, with escalator connection to the departure and other floors. In Brussels, the special platform in the Central station served by the Melsbroek diesel railcar is connected by lift and escalator with the arrival and departure halls of the Air Terminal, which, with the adjacent public entrances to and exits from the Central Station, are above the tracks and platforms of the six-track Junction Line linking Brussels Nord and Midi. The Melsbroek diesels run over the Brussels–Liège main line to a point beyond Saventhem, where the airport branch diverges. The service now consists of some 34 trains daily, from 6.30 to 20.30. In view of an expected fourfold growth of air traffic in the next eight years, consideration is being given to introduction of higher-capacity diesel trains and to enlarging the platform space at Brussels Central.

SWITZERLAND

More new works authorised

The Council of Administration of the Swiss Federal Railways has approved the start of several new works of importance, work on which is now beginning. One is the flyover at Brugg, which will diverge from the Basle–Zurich main line just short of Brugg station, cross the Berne–Olten–Zurich line and link up at Birrfeld with the branch from Brugg to Wohlen via Othmarsingen. When complete, this link will make it possible to divert through freight trains from Basle to the Gotthard line from the existing route via the eastern spur at Olten, Aarau, Rupperswil and Lenzburg to Wohlen, and thence by way of Rotkreuz and Immensee to Arth-Goldau. This will greatly relieve the heavily-occupied Berne–Zurich main line between Olten and Rupperswil, as well as facilitating the movement of the Basle–Gotthard freight traffic. As part of this scheme, doubling the single track between Wohlen and Rotkreuz is proceeding; doubling from there to Immensce is complete and in service. Another scheme now approved is the link between the Olten–Berne main line at Löchligut, between Zollikofen and Berne, and the Berne–Thun line at Ostermundigen, which will make it possible to run through trains from the Basle and Olten directions to the Lötschberg line without reversal, as now, at Wilerfeld or in the main station at Berne. At present seven such reversals take place daily and the number of through workings may well be increased after the new double-track link, signalled on both tracks for either-direction working, has been brought into use. In Berne itself steady progress is being made with the rebuilding and enlargement of the main station. The tunnel which is to bring the trains of the Solothurn–Zollikofen–Berne trains into a terminus below the main station, instead of into the street outside, has now been pierced and the new low level station is expected to come into use in 1965. Among other works, tunnelling has begun under the Biberlikopf, just to the east of Ziegelbrücke, as part of the final improvement of the Zurich–Sargans–Chur main line; the tunnel will form part of a cut-off through a new Weesen station to Gäsi, at the mouth of the 2-mile Kerenzerburg tunnel, opened several years ago as the first stage in this scheme.

Radio on the Gotthard line

Since the introduction of the winter timetable, radio communication has come into service between the locomotives of all through freight trains over the Gotthard line between Erstfeld and Chiasso and ten stations on the route now equipped to receive and transmit radio messages. As a result, each train requires no more staff than a driver (or two drivers in the case of the heavier trains with two locomotives, the second of which is usually cut into the middle of the train) and an "agent", or guard. In addition to the economy achieved by the reduction of personnel, this change has made possible an acceleration and simplification of the freight working generally.

"Gottardo" extended to Basle

The Zurich–Milan four-voltage electric TEE "Gottardo", 8.45 ex-Zurich, due Milan at 12.45, and 17.05 ex-Milan, due Zurich at 21.04, is to be extended to Basle SBB from May 30, presumably to give additional connections at Basle from and into trains from Germany, France and beyond. The significance of this change, however, is its effect on the diagramming of the four-voltage sets now working as the "Gottardo", "Ticino" and "Cisalpin" between Zurich, Milan and Paris (via Lausanne); present diagrams provide for a 24hr layover at Zurich for shops overhaul and extension to Basle complicates the allocation to each set of a new four-day roster, now being finalised.

An additional 42-seat first-class coach is to be included in each of these four sets, which recently have been running booked to capacity. Each train will then comprise four open firsts, restaurant car and power car, six vehicles in all. A new push-and-pull train is now operating on the right bank of the Lake of Zurich, comprising a Be 4/6 type motorcoach of 780 h.p. at each end, 1,560 h.p. in all, and six lightweight coaches intermediately; each train seats about 550 passengers. The ten E40 type Bo-Bo locomotives borrowed from the German Federal Railways to cope with the heavy additional traffic during the Lausanne Exposition have now been returned to Germany.

"Rheingold" to rank as TEE

According to preliminary announcement by the SBB, the "Rheingold" is to rank as a TEE from introduction of the 1965–6 timetable on May 30. This upgrading is the result of the November meeting of the Commission on TEEs. The Geneva portion (*see the December issue*) is to consist of a first-class coach from Amsterdam, and of a first-class coach, restaurant car and Vistadome car from Dortmund and baggage car and will run by itself as a block train. Between Basle, Berne and Geneva TEE supplements will be payable, but the "Rheingold" vehicles worked from Basle in ordinary expresses to Chur and Milan are to be available in Switzerland without supplement. The associated "Rheinpfeil" will be similarly raised in status. Apart from the locomotive-hauled Paris–Brussels–Amsterdam TEEs, "Etoile du Nord" and "Ile de France", which detach and attach Paris–Brussels Midi portions at the latter station, the "Rheingold" and "Rheinpfeil" are the only TEEs so far to embody more than one portion. The "Rheingold" will be the first TEE to serve Berne.

Threat to BVZ monopoly

The local authorities have decided to extend the motorable road up the valley from St. Niklaus to Zermatt. The resort's only public transport link with the outer world at present is the metre-gauge, electrified Brig–Visp–Zermatt Railway, which connects at Brigue and Visp with the SBB and at Brigue with the BLS and the metre-gauge Furka–Oberalp Railway, over which there is through running to connect with the metre-gauge Rhaetian Railway. No date has been announced for completion of the new road.

WESTERN GERMANY

Central signalbox at Munich Hbf.

A central relay-interlocking signalbox of the new SpDrS60 type, controlling all movements at and for some distance along the eight routes radiating from Munich Hbf passenger terminus, and the tracks to the carriage sidings a short distance from the station, was opened in October. It replaces 16 boxes and in many ways resembles the box at Frankfurt Hbf. The site is near the point where some 20 tracks (running lines and carriage roads) approaching the terminus from the west diverge into 36 platform roads. The box lies between the majority of these tracks and the seven leading into the 10 platforms of the Starnberger Flügelbahnhof ("side station"), which is the north part of the terminus, served by electric trains on the Starnberg group of lines and formerly a separate terminus. Similarly, to the south of the terminus is the Holzkirchner Flügelbahnhof for the Holzkirchen group of lines.

The box is connected by a covered passage with a road bridge (Hackerbrücke) spanning all tracks. To the west of the Hackerbrücke the running lines converge into seven double-track routes. These are styled (from north to south): Starnberger "local"; Starnberger "through"; Landshut; Ingolstadt (continuing to Nuremberg); Augsburg/Lindau (the two routes diverge at Munich–Pasing, 4 miles from the Hbf); the "locomotive double track" (leading to the m.p.d.); Rosenheim/Mühldorf (continuing from Rosenheim to Salzburg or Innsbruck); and Holzkirchen/Bayerischzell. Some of these lines (e.g. to Lindau) are not electrified. After embracing some sidings between them the eight double-track lines, including the two engine roads, diverge, but certain of them cross others by flyovers further west. They are in effect entirely separate pairs of tracks.

Each of the eight main routes—that is the total including both the Augsburg and Lindau lines but omitting the engine line, which terminates relatively near to the Hbf—is controlled by the new box for a distance from the terminus varying between 4 miles (Munich–Mittersendling, on the Holzkirchen line) and nearly 9 miles (Planegg, on the Starnberger local and through lines).

A *fahrdienstleiter*—senior signalman with the rank of traffic inspector—is in charge of each of four consoles, each covering a longitudinal area of the station, yards and approach lines. A "traffic supervisor", or senior inspector, exercises general supervision. There are no staff of ordinary signalman's grade in the box. To work the new box continuously, 58 operating and 16 maintenance staff are required, compared with 155 and 12 respectively by the 16 superseded boxes.

The control equipment is by Siemens & Halske. The box controls 296 sets of points and some 450 signals and daily train and shunting movements are respectively 1,000 and 5,000 on the busiest days, with over 600 engine movements. These last are an important factor, as a high proportion of the trains dealt with are locomotive-hauled, and some long-distance expresses reversing at the Hbf are given little time for attachment of turn-over engines, while intensive platform occupation at peak periods demands quick release of incoming train engines, for which there are no engine release roads; moreover, despite the separate working of the eight routes, topography has precluded flyovers or flyunders near the terminus, so that engine movements, transfer of through vehicles between trains, and transfer of trains from one main route to another necessitate many conflicting movements and smart operation over flat junctions. In the peak hour between 8.00 and 9.00 there is an average of 367 separate movements, of which only 60 are by trains.

The train describers in the new signalbox advise not only the individual train number but also the arrival or departure time of each train and the number of the motive power unit. As at Frankfurt, certain junctions are operated automatically according to the routing specified by the train describers.

The decision to concentrate regulation of movements on one very costly box resulted from increases in traffic and the consequent need to augment line and track capacities, since the topography precluded widening of the approaches to lay more tracks or move sidings to more convenient sites. In re-signalling, the opportunity was taken to reduce by half the distance between signals, so as to increase line capacity—the first time, it is stated, that this has been done in Germany on lines carrying an already intensive suburban traffic. Refinements in the box include more compact and clear illuminated diagrams. Loudspeakers and R/T communicate with shunting locomotive and yard staff. Total cost of the scheme was about £1¼m.

To Munich Exhibition at 125 m.p.h.

"The Railway of 1965" and "The Railway of the Future", in development of which science, technology and industry will play big parts, are the railway themes of the International Exhibition of Transport & Communications (IVA) to be held in Munich from June 25 to October 3. Two display halls will be devoted to railways, also a large open space to exhibit motive power, rolling stock and other equipment. The German Federal Railway (DB) has laid some 2 miles of track to serve the site and will itself occupy one hall, with foreign railways, the UIC and other international railway bodies, and railway industries represented in the other. The DB has announced that it is hoping to have completed track preparations in time to run specials conveying visitors to the exhibition at up to 125 m.p.h., between Augsburg and Munich. "The Railway of the Future" display under the auspices of the UIC will illustrate present and future applications of cybernetics and automation.

DB passenger traffic

Despite a 5 per cent reduction in total passenger train mileage and the increase in motor-car ownership, the Federal Railway succeeded in increasing its total of first-class passenger journeys by over 6 per cent in 1963 compared with the previous year; second-class passenger journeys increased by 2.5 per cent. These results are attributed mainly to better service in the form of faster and more comfortable trains. Car-sleeper services were very successful; the total number of vehicles rose by 38 per cent. In this connection, one notes that 50 per cent of German travel agents' clients purchased rail travel tickets and/or other rail facilities, but air travel bookings increased threefold. The Federal Railway is to introduce in the near future reservation of sleeping-car and *couchette* berths and of ordinary seats by electronic means. The type of system had not been announced at the time of going to press.

NORWAY

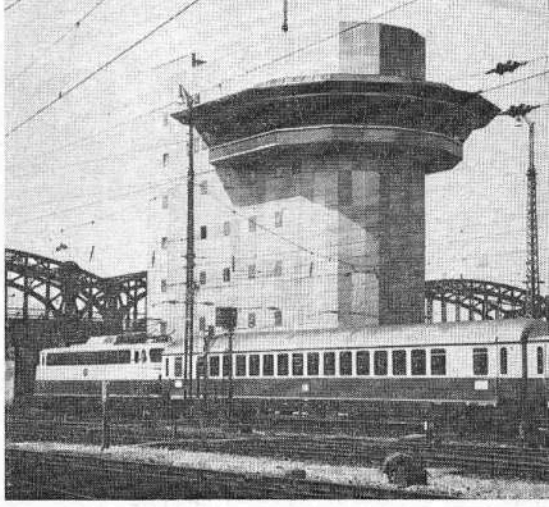
Eastern Oslo Metropolitan

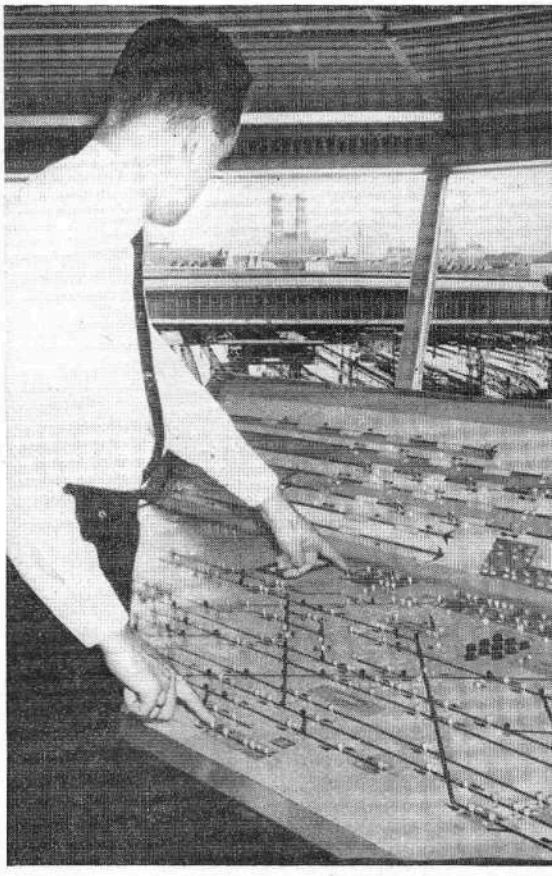
The first section of the Oslo Metropolitan line in the eastern part of the city is scheduled for opening this year. It is separate from the Holmenkollen and other lines starting from the National Theatre, but is ultimately to be connected with them. It comprises the line running in tunnel eastwards from the Jernbanetorget (adjoining the Oslo East terminus of the State Railways) to Töyen, beyond which it divides into three branches mainly on the surface. The total length of the eastern section is some 11 miles and the maximum gradient is 1 in 20. Trains will consist of a maximum of six cars. The main reason for the Metropolitan is stated officially to be not so much the number of road

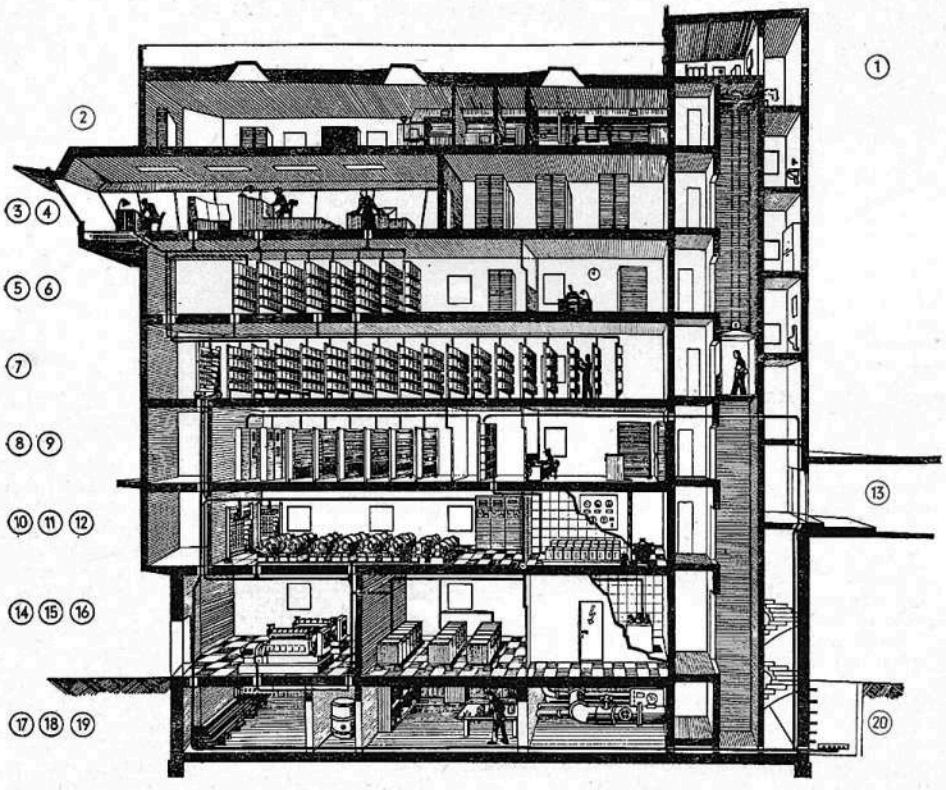
JANUARY 1965

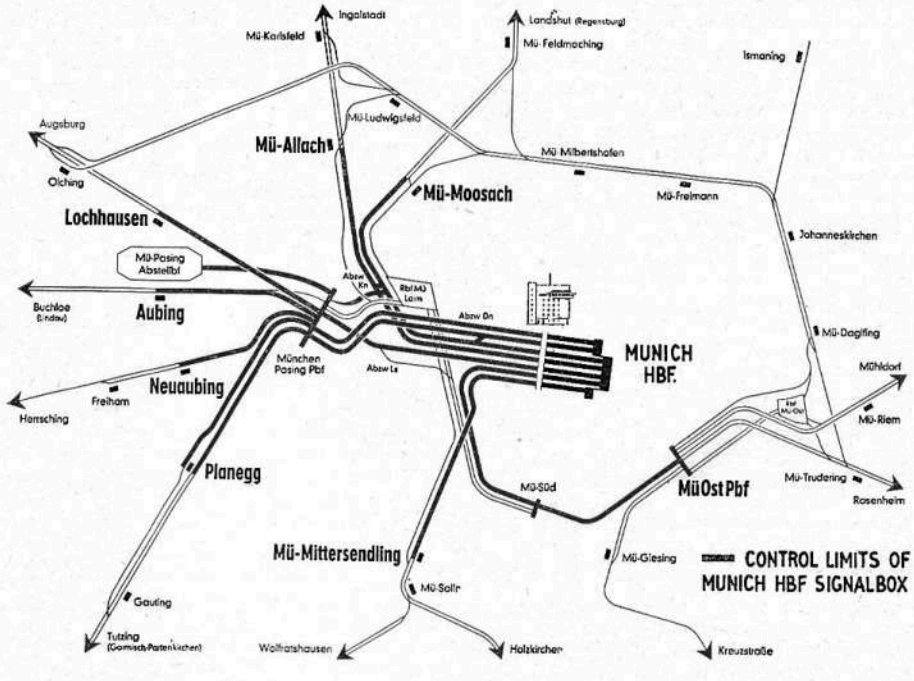
NEW SIGNALBOX AT MUNICH

The three photographs at right show: the exterior of the box, with the "Rheinpfeil" express in the foreground; one of the signalling consoles on the operating floor; and the panoramic view of the station, which handles about 150,000 passengers daily at its 36 platforms, with the "Rheinpfeil" departing when this photograph was taken, that is obtained from the operating floor. The map at the foot of the page shows the territory controlled by the signalbox. In the cutaway drawing of the signalbox below, the key to the various features is as follows: 1. R/T room; 2. air-conditioning plant; 3. operating room; 4. cloakroom; 5. signal relay room No. 1; 6. office for maintenance staff; 7. signal relay room No. 2; 8. telecommunications relay room; 9. office for maintenance staff; 10. alternators for signal power supply; 11. telecommunications batteries; 12. LT power supply; 13. access to bridge over tracks; 14. standby diesel generator; 15. signal batteries; 16. HT power supply; 17. signal cable lead-in; 18. store and workshop; 19. central heating; 20. telecommunications cable lead-in.









vehicles entering the city as the narrowness of some streets in the centre and the fact that the configuration of the ground results in a defile in the centre of the city for east–west traffic. Partly for this reason, there is renewed demand for a railway clear of (i.e. below) street level to link the NSB East and West termini (*see the November issue*). The only direct link between the NSB lines east and west of the city is by the line through the streets and along the waterfront, traversed by several freight trip workings a day, which impede road traffic and have caused accidents, more particularly to pedestrians.

Oslo—Bergen electrification

Full electric working between Oslo and Bergen began on December 7 (*see the November issue*). There is to be no radical change in the timetable before next May, however.

SWEDEN

New iron-ore branch in Lapland

Loads of up to 2,400 tons of iron-ore in high-capacity bogie wagons with an axleload of 25 tons are being moved over the newly-opened, 24-mile electrified branch from Kiruna to Svappavaara, in the Lapland iron-ore district. Much of the new line is laid over bog and construction costs were heavy. The bulk of the ore is moved by rail via the Norwegian frontier at Riksgränsen to Narvik for shipment.

HUNGARY

"Orient Express" extended eastwards

After terminating at Vienna during the autumn, the "Orient Express" is to run through to Budapest again during the Christmas and New Year period and again from early April, writes **J. H. Price.** The sleeping car from Paris is to be extended to Bucharest during the summer (*see the December issue*). Whilst the express stops short at Vienna, the Vienna–Budapest connection is provided by an Austrian four-car diesel train.

TURKEY

More diesels for the Bosphorus—Ankara line

Delivery to the TCDD of 40 2,000 h.p. U20C type Co-Co diesel-electric locomotives by General Electric (USA) will facilitate withdrawal of steam power from most passenger and freight working on the 360-mile, severely-graded main line from Haydarpasa (on the Bosphorus, and terminus of the wagon ferry from Instanbul) to Ankara, to which section most of these machines are being allocated. They incorporate most of the improvements in design adopted during the past six years, but have maximum interchangeability of components with the General Electric U18C type previously supplied. Equipment specified by the TCDD includes deadman controls, anti-slip device, four additional sandboxes with a capacity of 25 cu ft, and extra sanders. The total weight is 110 tons and continuous tractive effort 45,400 lb. The front hood is low, to give the driver a better view. The Haydarpasa–Ankara a.c. electrification project is reported to be in abeyance.

Link with Persian State lines

The opening in October of the 60-mile section from Mus to Tatvan, on the western shore of Lake Van, marked a further stage in building the standard-gauge link with the Persian State railways. There is to be a train ferry across the lake, from the eastern shore of which, near the town of Van, the TCDD, with the help of a loan from the USA, is extending its line 130 miles to make an end-to-end junction at or near Razi with an extension of the Persian State system westwards from Sharifkhaneh. Completion of the TCDD section is scheduled for mid-1966.

When the junction of the Turkish and Persian lines is effected, through working of vehicles will be possible, by means of train ferries, from the UK and Scandinavia to Teheran, to Bandar Shah on the Caspian, to Bandar Shahpur on the Persian Gulf, and to Yezd. From the last-named place the PSR is being extended to Zahidan, terminus of the Pakistan Western Railway 5ft 6in-gauge system which makes a connection with the Indian Railways.

the Irish scene

Edited by L. Hyland

CIE

THE port of Rosslare will assume a major role this summer in the transport of both passengers and cars across the Irish Sea. For the first time ever there will be three sailings each way on weekdays (two on Sundays) between Rosslare and Fishguard. Motorcars are expected to form a large proportion of the traffic and the present arrangement whereby they are ferried on a train of flat trucks from Ballygeary, on the mainland, to the pier—which lacks road access—is no longer tolerable. On November 9 replacement began of the goods road and one of the two tracks across the viaduct by a roadway. A loop for crossing trains will be arranged at Ballygeary cabin and some alterations to the trackwork on the pier, including the filling-in of the bay platform, will be necessary to leave room for the new roadway. The reconstruction is being carried out by CIE and is expected to take six months. The new arrangements will permit an increase of one-third in the car traffic, which last year reached 20,000 vehicles. The ship *St. David* is undergoing modification to increase its car-carrying capacity in connection with these improvements.

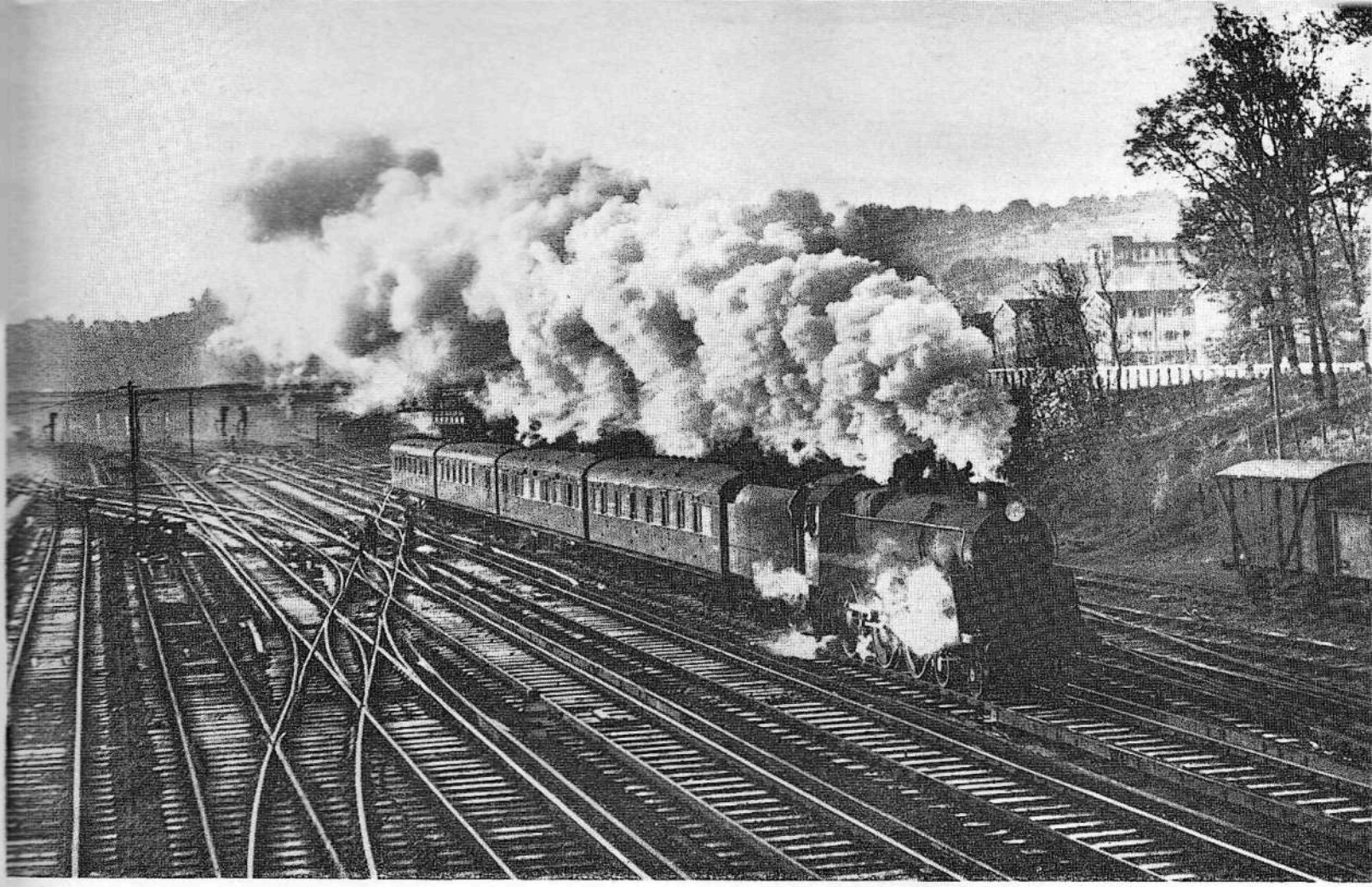
On Thursday November 26, 1964 President Kaunda of Zambia travelled from Limerick Junction to Dublin, Kingsbridge by rail. The regular 08.00 from Tralee was used, hauled by two General Motors 950 h.p. units, Nos. B151 and B142. The Presidential party travelled in the State Saloon No. 351. Also in this portion of the train was one of the two new first-class coaches, No. 1146 (specially fitted with tables), a dining car, brake second and a heating van. Ordinary passengers travelled in the rear portion—three coaches and a heating van, including the regular buffet car.

On Monday November 2, CIE conducted a market research survey on the Dublin suburban services. With the spread of the five-day week and, in particular, its introduction in Government offices last July, the suburban traffic pattern has altered considerably; trains from the city termini before 17.30 now carry far fewer passengers. A new timetable will be compiled from the information obtained in the survey, but it will not be introduced before the summer of 1965.

UTA

On November 9, following the approval granted by the Transport Tribunal on October 30, the UTA announced that after midnight on January 3 (not January 1 as stated in this column last month) it would cease to operate rail services between Portadown Junction and Londonderry via Omagh (75½ miles), Dungannon and Coalisland (5½ miles), and Goraghwood and Warrenpoint (10 miles). Since January 15, 1956 goods traffic only has been worked on the Coalisland branch, but both passenger and goods trains ran on the other lines to be closed, even if, between Newry and Warrenpoint, there has been only a token rail service in winter for the last four years. It is understood that when the UTA withdraws these services CIE will operate goods trains from Dublin to Belfast York Road and Londonderry Waterside via Lisburn and Antrim; three overnight paths have been arranged for these trains. The closure of the Portadown–Londonderry line has aroused criticism of the Northern Ireland government policy regarding railways on both sides of the Border. Traffic carried between Belfast and Londonderry by this route is overshadowed by the "free-to-free" traffic—from points in the Republic south of Goraghwood to points in the Republic west of Strabane and in Co. Donegal. The three sizeable towns en route, Dungannon, Omagh and Strabane, have been loud in their protests and at the time of writing Tyrone County Council is considering High Court litigation against the decision. It seems, however, that the Stormont government—on whose doorstep must be laid the blame for the plight of the railways in the area—is determined, notwithstanding dissent among its own supporters, to implement the closure programme outlined in the Benson Report of 1963.

On and from November 2, 1964 first-class accommodation was withdrawn from the Belfast–Bangor suburban section. This is in line with travel trends which have been encouraged by the constant fare increases of recent years. First class remains, however, on the Belfast York Road–Larne Harbour service and on the majority of Belfast Great Victoria Street–Portadown local trains.



Above: Class 4 4-6-0 No. 75074 leaves Guildford, SR, with the 8.45 Redhill–Reading on October 24, 1964. **Below:** A suburban electric multiple-unit approaches Guildford with the 8.52 service from Waterloo, passing Class 4 2-6-0 No. 76066, which was shunting a freight train on August 24, 1964.
Photos by Gerald T. Robinson

traffic report

Edited by G. M. Kichenside

London Midland

AS reported last month the LMR a.c. electric locomotives extended their range of revenue-earning operation from November 30, when their diagrams were revised to cover most passenger and freight trains north of Rugby. From the same date the Type 4 diesels on the Western Lines were re-diagrammed to make more use of them between Rugby and Euston in preparation for the ban on steam-powered through workings between Crewe and London effective from this month. As a result, Type 4s were reported on a number of low-class freights at the London end from November 30, in addition to their turns on express freights and regular passenger duties. The restriction on steam south of Crewe is not a total ban and pockets of steam power, particularly in the London area, will be retained for some months for local freight and shunting duties not covered by diesel locomotives, until full electric working to London is inaugurated later in the year. The high speed potential of the electric locomotives was amply demonstrated during trial running over the Trent Valley main line during October, with such times as 16min for the 23 miles from Polesworth to the Birmingham line flyover at Rugby.

Following the complete closure of the WR Hereford–Gloucester branch the Sunday 11.00 Liverpool–Plymouth and 8.55 return trains were re-routed from November 1 between Shrewsbury and Bristol via Wellington, Wolverhampton Low Level, Stourbridge Junction, Worcester Shrub Hill and the former Midland route to Yate instead of via the North-and-West line and the Severn Tunnel. On Sundays when the Severn Tunnel was closed for maintenance the trains had been routed via Hereford and Ross-on-Wye. As a result, Bristol-based Brush Type 4s now appear regularly over the LM-operated section of the former GW main line. Although the North-and-West line itself is now almost fully dieselised, the former GW Birmingham–Chester main line still sees a considerable amount of steam operation; almost all the Paddington–Birkenhead trains are steam-worked north of Shrewsbury, generally by Stanier or Standard Class 5s, although occasional "Halls" or "Granges" are also employed. Crosti-boilered 2-10-0s have also been reported on the former GW line—No. 92028 (2E) with the 15.00 Crewe–Banbury on November 5 and No. 92029 (2E) with the 3.25 Carlisle–Oxley on November 21. On November 11 the former train was headed by the odd combination of Brush Type 4 No. D1685 piloting Stanier Class 8F 2-8-0 No. 48346. On November 6 a locomotive was derailed at Sutton Bridge Junction (Shrewsbury) and during lifting operations its tender fouled the two rear coaches of the up "Cambrian Coast Express", which eventually went forward over 1½hr late with only four coaches. The down train was diverted between Shrewsbury and Welshpool via Gobowen (reverse) and Oswestry.

Two more Midland Lines BR/Sulzer Type 4 diesels have been named—No. D62 *Fifth Royal Inniskilling Dragoon Guards* and No. D70 *Royal Marines* in ceremonies at St. Pancras on November 30 and December 2 respectively. Recent withdrawals have removed the last Fowler Class 2F dock shunter 0-6-0Ts from capital stock. The original WR gas-turbine locomotive No. 18000 has been moved from Rugby and was noted at Market Harborough during October.

Although Stanier Class 5 4-6-0s continue to dominate Great Central Marylebone–Nottingham passenger and parcels turns, an unusually large number of failures by Annesley engines during the last week of November led to the appearance of visitors from depots on other lines and one, No. 45204, from Holbeck; even then motive power appeared to be in short supply at times and on several occasions Cricklewood had to resort to nothing larger than an Ivatt Class 4 2-6-0 for some rosters. On one occasion the only locomotive available to power the 20.45 Marylebone–York parcels was that from the 17.15 Nottingham–Marylebone, which did not arrive until 20.35.

[For LMR information we are indebted to Messrs. D. T. J. Rollason, M. R. Hall, G. R. Baxter, B. R. Tunnard, A. G. Briggs, D Gartside, M. Clark, J. Hatcher, S. J. Morris, D. A. M. Edwards, A. Gomersall, D. R. Thornhill, H. Gillott, T. S. Lord, T. H. Fisher and B. Hartley.]

Eastern and North Eastern

The latest official motive power alterations lists confirm that seven Brush Type 4 diesels were allocated to the GE Line during October and November, Nos. D1531/2/42 to Norwich, D1538/55/65 to Stratford and No. D1763 to March. A correspondent suggests that 10 Brush Type 4s are expected on the GE Line and that they will replace the 10 English Electric Type 4s which will be transferred away. This move is understood to be an endeavour to combat unpunctuality while extensive p.w. work is in progress. Crew-training runs with the Brush Type 4s continue and at least four trips daily run to and from Cambridge. The Stratford-based locomotives are working a diagram which takes them westwards from Stratford over Channelsea Curve to attain the Lea Valley line to Cambridge and Norwich; they return to Stratford via the Colchester main line.

Two Class B1 4-6-0s, Departmental Nos. 21 and 23, formerly Nos. 61233 and 61300, are at Cambridge for steam-heating purposes. Another arrival at Stratford works for storage is GW "King" Class 4-6-0 No. 6000, which has joined the other locomotives listed last month held for preservation.

Three 0-6-0 diesel-mechanical shunters, Nos. D2028/30/1 and diesel-electric shunter No. D3494, which were used for shunting and trip freights on the Peterborough East–Seaton line, have been transferred from March to New England following the transfer of administration of this line from the GE to GN Line authorities.

A correspondent points out that three regular steam turns still exist on the GN line south of Peterborough on coal trains as far as Hitchin; the trains concerned arrive at Hitchin at about 6.00, 11.00 and 15.30 and are diagrammed for B1 haulage from New England. Brush Type 2 diesels take over at Hitchin for the onward journey to London, but the B1s return light to New England.

At times of motive power shortage Doncaster occasionally utilises locomotives from other Regions awaiting overhaul at Doncaster works for revenue-earning duties; on November 12 Cardiff Canton Brush Type 4 No. D1592 was employed in this way on a Rossington Colliery–Thorpe Marsh Power Station coal train. The latest English Electric Type 2 "small Deltic" to return to service is No. D5902, which was noted on a trial run from Doncaster to Grantham on November 4.

Other Sheffield scrapyards in addition to those mentioned in the October issue are now breaking up withdrawn steam locomotives; Steel, Peech and Tozer's yard is believed to have been newly-built for the purpose and now accommodates up to 30 locomotives, including two "Merchant Navy" Pacifics Nos. 35002/15, which were towed down the GC main line during October.

Clayton Type 1 diesel No. D8608 commenced trials on coal trains from Warsop main colliery at the beginning of December. The trials with experimental brake-fitted hopper wagons on the High Marnam power station block coal trains do not yet seem to have been concluded, for a number of the trains are still composed of ordinary non-fitted wagons, for which WD 2-8-0s are retained at Langwith Junction.

[For ER and NER information we are indebted to Messrs. H. E. Jones, B. P. Reynolds, A. R. Smith, C. E. Watson, A. S. Ellis, "60114", P. Depledge, J. R. Yelverton, R. L. Castling, A. D. Cooper, I. G. Marsden, Mr. Newman, R. P. Hill "Pinza", P. M. Wright, P. Duncan, A. D. Blazey, K. Lander, G. Tweedie, B. Hartley, P. M. Forrow, W. Sharp, M. Clayton and G. K. Browning.]

Western Region

Deliveries of English Electric Type 3 diesels to South Wales were resumed in October; Nos. D6944/5 are allocated to Cardiff Canton and have been employed on crew training between Merthyr and Cardiff. The additional Type 3s and altered Brush Type 4 diagrams, which now take in more duties on the South Wales main line, resulted in a reduction in the number of steam workings in South Wales at the end of November. West of Cardiff about 95 per cent of all trains are now diesel-powered. Among the trains now Brush-hauled are the mid-day Llandarcy–Llanwern oil trains. On November 4 two Brush Type 4s successfully worked a double load of oil tanks up Stormy bank at Pyle—a total load of 70 vehicles. Nevertheless, steam locomotives are still employed on a number of regular diagrams, as for example the afternoon Briton Ferry–Birmingham steel billets train and a few local, low-classed freights. The surviving steam duties are generally in the hands of 28XX and Stanier 2-8-0s, 2-10-0s and Standard Class 5 4-6-0s. An unusual visitor on Midlands–South Wales freight at the beginning of November was Stanier Class 5 4-6-0 No. 45344 (5C), noted wrongly carrying the LMR electrification yellow band on its cabside. When the Valleys steam sheds at Merthyr, Abercynon and Aberdare are closed, the surviving 56XX 0-6-2Ts are expected to be

transferred to Severn Tunnel Junction to work out their remaining time.

English Electric Type 3 diesels Nos. D6939/40/1/3 appeared at Worcester at the beginning of November for crew-training duties. They have been employed turn and turn about on the same set of empty coaches as the Brush Type 4 engaged on similar duties.

The fleet of NBL Type 2 diesel-hydraulic locomotives at Old Oak Common for use on empty coaching stock duties to and from Paddington had reached 10 by the end of November, Nos. D6326/35/43/51/2/3/4/5/6/7. One of the Swindon-built Paxman-engined Type 1 0-6-0 diesels, No. D9521, has also arrived at Old Oak Common for crew training.

The shortage of diesel locomotives arising from the delay in the supply of replacement components now seems to be aggravated by the annual train heating boiler troubles with the arrival of colder weather, for large number of "Western" Type 4 diesels were reported on freight duties during November. Presumably shortage of diesel power is also responsible for the continued employment of steam traction on the twice-weekly bulk cement train between Westbury and Newton Abbot. This train, which is usually composed of up to 21 cement wagons, now runs on Mondays and Thursdays; the locomotive generally returns light to Westbury on Tuesdays and Fridays.

Some WR diesel multiple-units running in the West Country have been reformed; former three-car non-gangwayed units without toilet facilities and three-car gangwayed Cross-Country units appear to have exchanged trailers to provide some toilet facilities in both types of set. Nevertheless many of the units on the former Southern main line are without toilet facilities despite the lengthy runs on which they are employed.

Changes in the allocation of some of the WR departmental diesel locomotives have brought No. PWM 650 to Theale from Newland, and PWM 654 to Newland from Hookagate while PWM 653 from Theale undergoes an overhaul at Swindon. As a replacement, 204 b.h.p. diesel shunter No. D2200 has been transferred from the ER to Hookagate.

A Stratford-based EE Type 3 diesel now has a regular working to Oxford via the Cambridge–Bletchley line; the locomotive arrives at Hinksey Yard with freight at about 14.15 and departs eastwards with a return freight at about 15.45.

Part at least of Swindon shed is reported to have closed during November. Following the concentration of parcels traffic in the Chippenham area at Chippenham station the locomotive diagram covering the Westbury–Sheffield passenger train between Westbury and Swindon has been revised; it is now covered by a Westbury locomotive, generally a "Hall" Class 4-6-0, which continues from Swindon on a parcels train at 20.10 to Bristol, calling at Chippenham to attach vans.

Two former SR "Merchant Navy" Pacifics Nos. 35009/25 were among arrivals at South Wales scrapyards during November. They travelled from Exmouth Junction via Gloucester. Although thought to be destined for the Swansea area they reached no further than Barry. Two days later, another "Merchant Navy" was reported in the Bristol area, this time in steam, when No. 35029 headed west with a parcels train through Bath Spa.

Recent withdrawals have included the last "County" class 4-6-0 No. 1011 and the last of the Collett 1366 0-6-0PTs built for dock shunting. A tally of "Castle" class 4-6-0s shows that only about 12 are still at work, Nos. 5042, 7013/22/34 on the WR and Nos. 5014/56/63, 7014/9/23/4/9 on the LMR-controlled former GW lines in the Birmingham area.

The only Class 1 trains on the Western Region now booked for steam haulage are inter-Regional trains. They include the 10.00 Bournemouth West–Manchester and 10.00 return and the 10.50 Bournemouth West to York, which between Bournemouth and Oxford have Bulleid Pacifics, the 10.08 York–Bournemouth West, which has a "Hall" or "Grange" from Banbury to Bournemouth, the 17.45 (FO) Birmingham Snow Hill–Paddington and the 0.05 (Sundays) Manchester–Plymouth between Wolverhampton Low Level and Bristol, which both have Oxley "Castles".

The withdrawal of three passenger services in the Gloucester area from November 2—Gloucester Central–Hereford, Gloucester Central–Chalford, and Berkeley Road–Sharpness—brought to an end the working of former GW 2-6-0s and 0-6-0s on passenger trains and of 0-4-2Ts on auto trains. As already mentioned in the LMR notes, the Sunday Liverpool–Plymouth trains have been diverted via Wolverhampton Low Level and Stourbridge Junction to reach the Midland Line via Yate to Bristol.

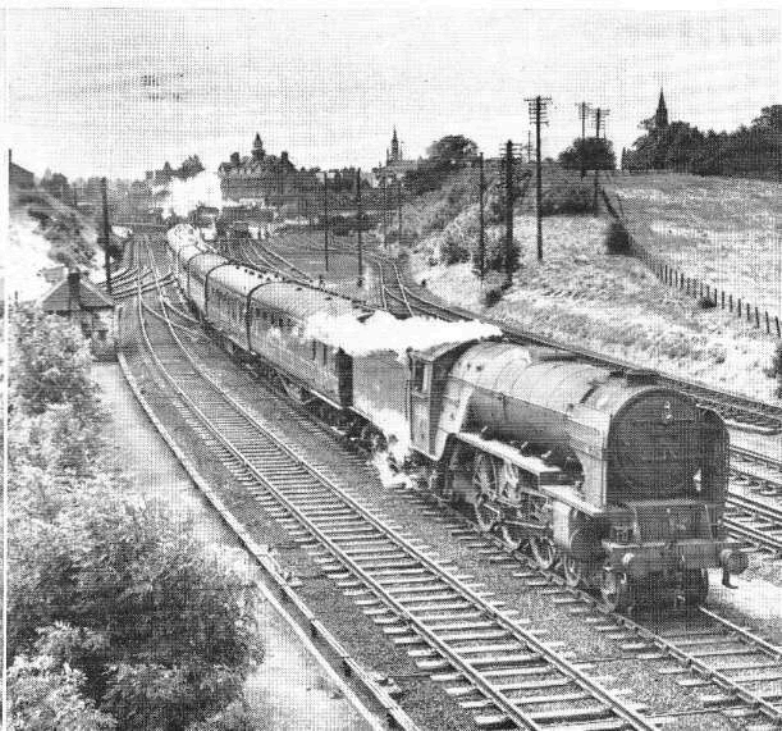
[For WR information we are indebted to Messrs. C. M. Napper, R. N. Pritchard, G. R. Scovell, P. Mallaband, A. R. Groucher, G. H. Davies, V. Bunting, D. T. J. Rollason, "7017", J. G. Stockley, R. Greer, L. A. Tubb, J. A. R. A. Arnott, J. R. E. Moreton, A. K. McKnight, B. S. Trite, D. Viner, D. Haines, T. Gurney, D. J. Curtis, R. Taylor, J. Follows, J. S. Nicholas and J. Towner.]

Southern Region

The shortage of Birmingham/Sulzer Type 3 diesels on the SR continues to affect motive power rostering in all three divisions; at the beginning of November, 35 units were reported to be out of service for a variety of reasons. On the SW Division, freight services from Feltham are largely steam-worked, including the inter-Regional freights powered by the SR locomotives; the usual locomotives employed are Class 5 4-6-0s, SR light Pacifics, Standard Class 4 2-6-4Ts and the few remaining Class Q1 0-6-0s. Most of the freights to and from Feltham handled by the Eastern and London Midland Regions are diesel powered, generally by Type 1s or 2s; however BR/Sulzer Type 4 diesels have been reported more frequently on Brent–Feltham trains and English Electric Type 3s have been employed on a number of freights to and from the ER—as, for example, No. D6714 on the 10.45 Purfleet–Feltham additional cement train and 13.57 Feltham–Ripple Lane on October 20. This is the first time that EE type 3s have been reported on freights to the Southern, although they are frequently used on through workings to the LMR and WR. An unusual visitor to the Hounslow loop line on October 23 was "Warship" Type 4 diesel No. D828 at the head of the 19.45 Exeter–Waterloo van train, which had been diverted from its normal route.

The variety of steam types reported on Reading–Redhill–Tonbridge trains has increased with the use of former Exmouth Junction Standard Class 3 2-6-2T No. 82024, which was noted on a number of workings on this line during the middle of November.

Left: Diverted via Lockerbie because of Sunday engineering work, a tender-first "Britannia" Pacific, No. 70037 *Hereward the Wake*, passes Lochmaben, on the branch from Dumfries, with a milk train for Perth on September 6, 1964.
Right: Class A2 4-6-2 No. 60535 *Hornet's Beauty* leaves Dumfries with a Carlisle–Glasgow stopping train in July 1964. *Photos by D. Cross*



The various types of diesel multiple-unit employed on the Oxted line have now settled down to fairly regular duties. The Hastings six-car unit, which is generally one of the short underframe variety, works the 6.25 Victoria–Brighton via Oxted and the 9.52 return by the same route; the Hampshire unit is normally used on Saturdays on the 8.08 Brighton–Oxted and 12.58 return. The use of the Hampshire units with their 9ft body width is limited to those Oxted line duties not involving trips between Tunbridge Wells West and Tonbridge because of the restricted clearances in the tunnels on each side of Tunbridge Wells Central station.

An Ivatt Class 2 2-6-2T No. 41295 has been transferred temporarily to Ashford works to replace Class C 0-6-0 No. DS239 which is being re-tubed. The other Class C at the works, No. DS 240, is in use as a stationary boiler.

Extensive repairs to the tunnel at the London end of Southampton Central station under the forecourt of the Civic Centre have resulted in the introduction of single-line working through the tunnel itself to allow work to progress during traffic hours. The main part of the job, which involves renewing the base of the tunnel under the tracks, is being carried out in two four-week periods from the middle of November to December 13 and from December 29 to January 25, but week-end possessions will be needed at other times for the renewal of the tunnel lining, which in places has bulged under pressure from the foundations. Local services have been altered and some have been diverted to run to and from Southampton Terminus. A complete possession of the track for relaying between Swaythling and St. Denys on November 1 led to the diversion of Waterloo–Bournemouth trains via Fareham.

Despite the large nominal allocation of "Merchant Navy" locomotives, Bournemouth line expresses are frequently in the hands of light Pacifics or even Class 5 4-6-0s. Further deliveries of new Brighton line 4-CIG express electric units are not being delayed until the completion of trials with the first units, for five more, Nos. 7302–6, were delivered during October and November. The classification letters of these units is now understood to indicate Corridor—or Buffet—Intermediate Guard's van. A correspondent points out that the use of 4-CEP unit No. 7207 as royal train on October 30 was not the first such occasion, since a 4-CEP unit was used by the Queen from Arundel to Victoria and back on July 30 last.

[For SR information we are indebted to Messrs. R. S. Tangye, D. T. J. Rollason, R. D. Shotter, N. Diaper, J. E. Fisher, A. Wright, M. Sharp, M. P. Stead, P. E. Moore, B. H. Coom, D. J. Bishop, R. M. Weeden, R. Remnant, J. Press, P. Foster and J. B. Latham.]

Scottish Region

The withdrawal last autumn of Class A4 Pacific No. 60012, and more recently of No. 60023, without replacement appears to herald the start of a run-down in the steam allocation at Ferryhill; until now, any losses at Ferryhill have been made good by transferring locomotives from St. Margarets or sheds in the E and NER. At the same time, one of the Standard Class 5 4-6-0s recently transferred to Ferryhill, No. 73058, has been placed in store and is thought to be a candidate for early withdrawal. Two more diesel workings have been introduced in the Aberdeen area; the 16.17 up parcels is now diagrammed for an Inverness Type 2 as far as Perth and the 18.44 Aberdeen–Manchester fish has a Type 2 diesel as pilot to a Stanier Class 5 4-6-0. However, the practice of employing an NBL Type 2 as pilot to a steam locomotive on the 14.11 fish from Aberdeen, introduced last spring, is now practically non-existent and the normal combination is a Ferryhill A4 piloted by a Perth Class 5 4-6-0.

[For Scottish Region information we are indebted to Messrs. A. McGowan and D. W. Smith.]

Workshops

Recent Darlington arrivals there for overhaul have included Stanier Class 5 4-6-0s and at least one Stanier 2-8-0, No. 48441, probably the first to be dealt with at Darlington since the batch of Stanier 2-8-0s built there for the LNER during the war. It seems likely that steam overhauls will be separated from diesel repairs and that the latter will be concentrated on Swindon, Doncaster, Crewe and Derby. Swindon works is reported to be ceasing the overhaul of steam locomotives after this month.

At Crewe works at the end of November frames for Brush Type 4 locomotives had been laid up to No. D1667. The running numbers for the latest Brush Type 4 orders will complete the series up to D1999 and will then jump back to start again at D1100 to D1111. At least 300 of the Brush Type 4s still to be delivered will be fitted with automatic air-brake equipment for working trains of air-braked stock; the locomotives concerned are expected to be Nos. D1631–81, D1758–99 and D1100–11.

[For Workshops information we are indebted to Messrs. S. M. Hardy, "45645" and "5071".]

motive power report

THIS list is correct to the following dates: LMR, October 31; ER, October 31; NER, November 21; ScR., October 31; SR, November 20; WR, November 22.

MOTIVE POWER DEPOT CHANGES

Dawsholm (65D) closed as from October 5.

NEW LOCOMOTIVES

2,750 h.p. Diesel-electric Co-Co: D1624/6/7/8/9/30-16A; D1631-5A; D1767/8/9/74/5/6/8/9/80-41A; **1,750 h.p. Diesel-electric Co-Co:** D6947/8-86A; **1,250 h.p. Diesel-electric Bo-Bo:** D7501/2/3/4/5/6/7-16A; **900 h.p. Diesel-electric Bo-Bo:** D8608-41A; **650 h.p. Diesel-hydraulic 0-6-0:** D9513/4/5/6/7/8/9/20-86A.

LOCOMOTIVES REALLOCATED

London Midland Region: W/E October 10: 3850/5-6E; 42705/33/99, 42831, 42905-9G; 43066/95, 43105-10A; 43088, 43151-5B; 43918, 44429-16E; 44177-9E; 44203-15E; 44528/99-16G; 44674/92-12A; 44835, 45190, 45406-16B; 45143-6G; 45598, 45667/84, 45721-8K; 45670-9B; 45674-5A; 46140/55-12A; 46504/6-9M; 48026, 48521/36, 48682-9J; 48106, 48523-9M; 48176-10C; 48218/97-10J; 70001/5/16/22/9/32/48/9-12A; 73066/9, 73156-2L; 75038-6D; 75055-1E; 90268-9G; 90306-8L; 92050/1/2/76-9D; 92117/27-8C; D80/2-14B; D163/5, D2376-16C; D2859-9D; D2862/8-10D; D5187, D5295/6/7-16D; D5193, D7568/85-16C.

W/E October 17: 42712/54-9G; 43947-9E; 44137-2E; 44211-10G; 44247-9D; 45289-16B; 46122-12B; 47535/43, 47611-16G; 48318/97, 48708-9J; 90222/61, 90448-10F; 90533-9G; 90632, 90725-8F; D2867-10C; D5294-16D; 12091-2K; 12094-2C.

W/E October 24: 1628—On loan to Sir Alfred McAlpine & Son; 4178-2A; 6934-2D; 42184, 42284-16C; 42369, 42700/78, 42878-9G; 43011/27/36, 43103-10A; 43949-2E; 43967/82, 44054-16G; 44125-10G; 44179-2E; 44218-5B; 44222-10H; 44235-16G; 44390-12B; 44484-12D; 44571-5B; 45267, 45333-16B; 46428/42/57/70, 46505-2L; 47653-5E; 48029-8C; 48381-15B; 48494-16D; 48509-8C; 48651-16F; 73026-2L; 90222-8L; 92056-9D; 92083/6, 92105/6-15A; 92113-16B; D3792-16A; D5281/4/5/6/7/8/90/1/2/3-14B; D5298-16D; D7569/71/2/3/4/5/6/7/81/96-16C; 12063-16D.

W/E October 31: 6980-2D; 7820-2B; 42053-9E; 42075, 42104, 42209, 42478/88-5D; 42232-12E; 43045-10A; 44894, 45196-10F; 47266-6J; 48250, 48535-9J; 78030-5B; 78059-6H; D7578-16A.

Eastern Region; W/E October 24: D1531-32A; D1533/49/59/61/2/3, D1758-34G; D1538/65-30A; D1763-31B.

W/E October 31: 43064/91/3, 43149-41D; D1532-32A.

North Eastern Region: W/E October 24: 60116/27/51-52A; 67690-51A; 90723-52H.

W/E October 31: 45602/61-55A; 60142-52A; 90588-51C; D398-50A; D2065-55F; D3656/8-55C; D7578-LMR.

W/E November 7: 62050-52D (Alnmouth); 73163/5, 77011/4-LMR.

W/E November 14: 48542-55A; 48689-55B; D2161-55F; D3657-55H.

W/E November 21: 42194-51A; 43140-52F; 63343-51C; 77002/4-52D.

Scottish Region: 4 weeks ending April 25 (additional): 60026-61B; 60836-62B.

5 weeks ending October 31: 42131/95/9-66A; 42194, 42269-NER; 42197-66D; 42861, 42919-67C; 46413-67D; 61245, 61308-64C; 61400-62A; 64563-65A; 64570-62A; 64571, 64611/23-62C; 65912/20-64C; 76046, 76100/1/2/3-65F; 76074-67E; 80004-67A; 80005-67C; D2754/5-64A.

Southern Region: period ending Nov. 9: Nil.

Period ending November 16: D3469-73C.

Period ending November 20: 33006/20/6/7-70C; 34019/77-70D; 41224/95-70F; 73016/65-70A; 73083-70G; 73155/68/9/70/1, 80012/8-70D; 80095, 80133/7/43/54-70A; D6504-70D.

Western Region: 2 weeks ending November 1: 3758-82F; 92226-86B; 92242-86E; D6355/6-81A.

W/E November 8: 1612/3-88B; 2242/87-85B; 2890-86B; 3690-87A; 3728-88B; 3814/35-81E; 3823, 4107/57-86E; 4110-88B; 4161-85A; 4268-88J; 4285-86G; 4623/50/79-88B; 4668-86G; 4675-87F; 4932-86E; 5206-86G; 5601/5/77/86/8-88D; 5691/9-88B; 5961-86E; 6106-81E; 6113-82F; 6128-81C; 6628-87A; 6649-88D; 6654-88B; 6815/37/8/60/72-88A; 6918/35/65-82E; 6932/73/84-86E; 6958-85A; 7226-88J; 7808/13-85B; 7816/29-81E; 7913-86E; 8484, 9437-88B; 9600/31-87A; 9611/22/67/82-88B; 9649-86B; 9680-85A; 9773-81F; 9790-85B; 48732/60-87F; 92236/7/43-86E; D2128-86A; D2129/83-84B; D3510/23-86A.

W/E November 15: 5235-86B; 6658-88D; 7249-86B; 7909-85A; 41208/16-83D; 73019/28/96, 92224-LMR; D1583/6/7/8/9/90/1/2/3/4/5/6/7/8, D1613-87E; D6339-83A; D6353-81A; D6852/5/85/92, D6906/13/26/30, D9511-86A.

W/E November 22: 6924/74, 7910-81F; 9605, 9790-83C; 41208-83G; 41249-83D; 44422-82E; 44560-85B; 92207-86B; D3030-81A.

LOCOMOTIVES WITHDRAWN

1011, 1369, 1420/44/53/8/72, 1631/9/41/57/8/64/7, 2217/8, 2891/3, 3210, 3400/1/2/5/6/9, 3601/21, 3730/9/97/8, 3809/10/56, 4133/71, 4233, 4610/6/53/74, 4919/32/89, 5000/54, 5184, 5571, 5609/60/2/70/94, 5927/39/79, 6115, 6367, 6412, 6602, 6806/10/21/63, 6900/71/96/7, 7026, 7223, 7318/20/7, 7782, 7815, 8402/37/69/93/5, 9430/53/94, 9606/32/54/60/77/9, 9706/29/78/82, 30834, 31410, 33015, 34072/99, W32, 41248, 41300/10, 42056/89, 42126/7/43, 42218/45/62, 42359, 42414/45/51/74, 42588, 42629, 42717/25/48/55, 42907/26/34/70, 43072, 43871, 43940/7/88, 44042/5, 44146, 44236/44/60/75, 44384, 44460, 44534, 44603, 44719/45/51/6, 45103/36/83, 45526/83/98, 45663/70/4, 46122/56, 47354, 47640/53, 48657, 60023, 61031, 63341, 63423/38, 63773, 64552/5/63/73/91, 64636, 67636/8/40/3/78/84, 69016/28, 73012/24, 73109, 76054/73, 80036/56/62/77, 80106/15/25/9, 84001/20, 90098, 90127, 90344/54/89, 90412, 90535, 92210/29.

Additional entries, not previously reported: 4122/8/36/43/59/66/74, 6361, 6940/54, 7825, 8743, 9450, 41297, 42124, 45476.

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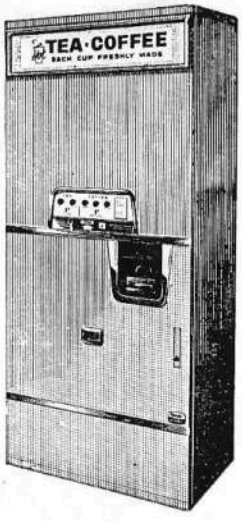

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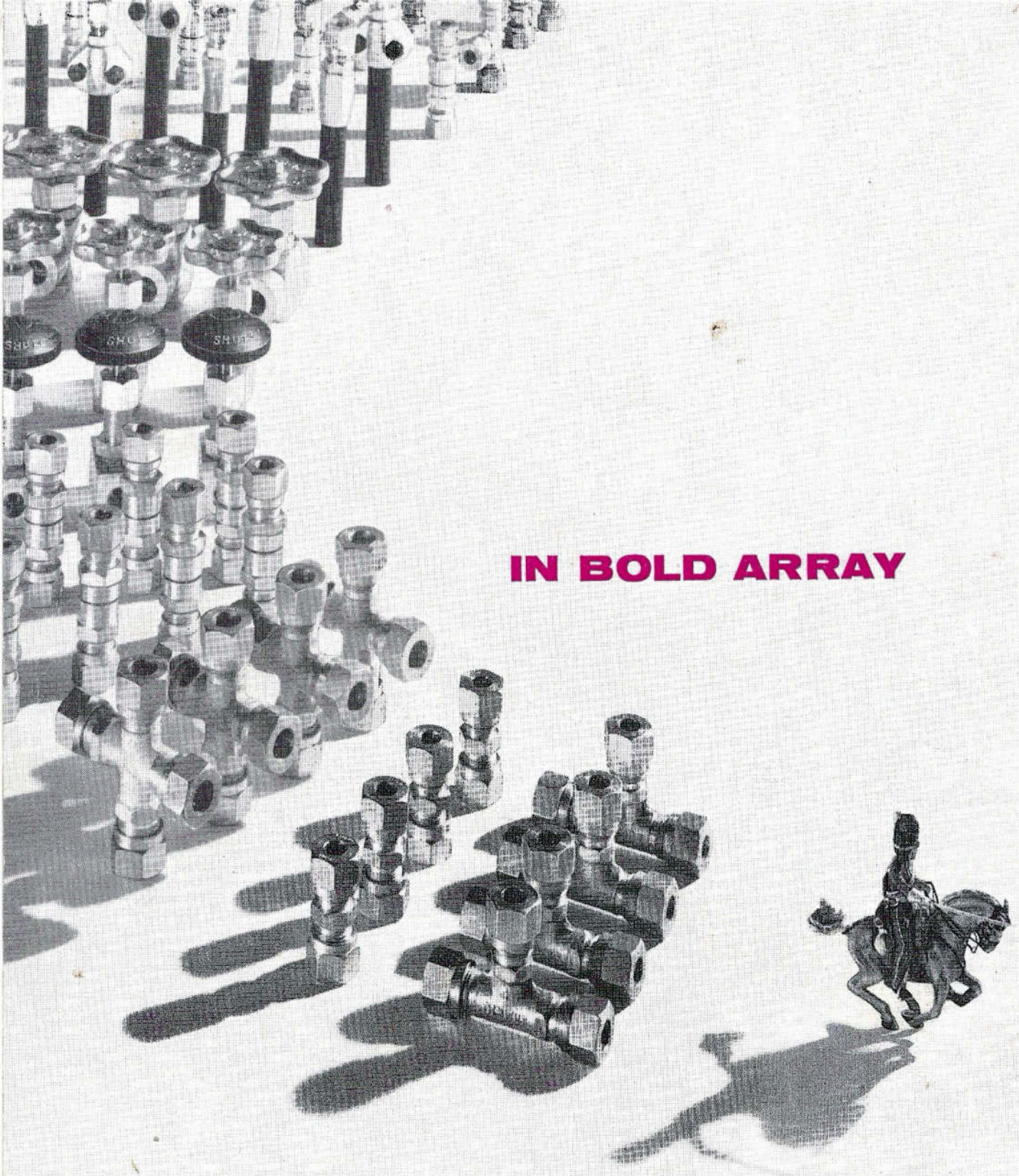

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